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SUWANNEE AREA PHYSICAL EDUCATION PROJECT. INNOVATIONS IN ELEMENTARY PHYSICAL EDUCATION EQUIPMENT.
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THE APPARATUS, EQUIPMENT, AND COURSES DESCRIBED IN THE REPORT ARE PURPORTED TO BE DESIGNED TO DEVELOP A HIGH LEVEL OF PHYSICAL FITNESS AND TO IMPROVE MOTOR SKILLS, AGILITY AND BALANCE. INFORMATION ON EQUIPMENT COST, SAFETY FACTORS, MAINTENANCE, AND PLAYGROUND PLACEMENT FOR DIFFERENT TYPES OF EQUIPMENT IS CITED. SPECIFICATIONS ARE GIVEN FOR OBSTACLE COURSES AND EQUIPMENT, HARD SURFACED GAME AREAS AND EXERCISE EQUIPMENT. DIAGRAMS FOR VARIOUS TYPES OF OUTDOOR APPARTUS ARE ALSO INCLUDED. (GM)

DPSC. 67-3943

SUWANNEE AREA PHYSICAL EDUCATION PROJECT

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A Title III Project Designed To Improve Programs Of Elementary Physical Education

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INNOVATIONS IN ELEMENTARY PHYSICAL EDUCATION EQUIPMENT

EF001592

ADMINISTERED BY COLUMBIA COUNTY BOARD OF PUBLIC INSTRUCTION
B. H. GALLOWAY, Secretary and Superintendent

Melrose Park Elementary School, 1500 East Putnam Street, Lake City, Florida 32055 was designated as the site for the development of a model playground and program. The equipment and facilities described in this booklet can be seen at the Melrose Park School. Additional information may be obtained by contacting the principal, Mr. Roy Dicks, or the project office.

INTRODUCTION

The apparatus, equipment, and courses constructed and emplaced on this playground are designed to aid in the development of a high level of physical fitness, and to improve motor skills, agility, and balance. Motivation is the key to achievement in any teaching-learning situation, and safely constructed, challenging, attractive, apparatus can be the stimulus which will motivate pupils to their best efforts. It is not intended to imply that the use of such equipment constitutes a complete physical education program, nor that the equipment illustrated in this booklet is the only equipment to have been found to be satisfactory. Rather, this booklet is intended to provide a possible aid to others who desire to add such INNOVATIONS to their programs. Certainly all physical education programs should include activities that require vigorous efforts on the part of the pupils and should be one of the prime criteria in the selection and use of playground equipment.

GENERAL FACTORS RELATED TO CONSTRUCTION

Generally accepted criteria for the development of playgrounds were considered when selecting the area on which to locate the different pieces of apparatus. Namely, these are: accessibility to pupils who will use it most; along the perimeter of the playground in order not to create hazards in areas needed for large group or team games; sufficient distance from classrooms so as not to create additional distractions; avoiding low areas; shaded areas if available for certain apparatus; and the total view afforded the instructor for supervision.

Many of the items of equipment can be purchased or constructed locally. Local purchase is usually cheaper for the item itself and

the purchaser will also save the cost of the freight. All apparatus constructed of pipe should be emplaced in concrete. In order to more easily level the equipment prior to pouring the concrete, a steel plate several inches larger that the diameter of the pipe should be welded to the end which will be placed in the ground. Ends of exposed pipe should be capped or closed with a weld. Holes should be dug larger at the bottom than the top, and bricks placed under the uprights so that the concrete will surround the pipe and make a stronger footing. One method of bracing is to place a support under the piece of equipment at the desired height until the concrete has set. Holes should be filled to within approximately two inches of ground level and the concrete should be tamped as the hole is being filled. When emplacing uprights constructed of wood, holes should be filled with dry sand. Burned oil poured in the hole when it is about half filled will penetrate the soil surrounding the uprights and help to preserve it. It is desirable that all wood be dressed and the corners chamfered. In the absence of specified dimensions, a guide for the depth poles should be set is: 16' above ground - 5' below; 12' above ground - 4' below; 8' above ground - 4' below; and 4' above ground - 3' below.

Painting the apparatus with bright colors makes it more attractive and appealing to pupils. Shavings, sawdust or some other buoyant material should be placed under apparatus from where children will be suspended. The end of the equipment where pupils begin to cross should be painted green and the other end red. This prevents "mid-air" collisions and correlates with traffic safety.

SUGGESTIONS FOR USING EQUIPMENT FROM WHICH PUPILS HANG, SWING OR ON WHICH THEY CLIMB

1. Pupils should be taught to grasp with the thumb in opposition to

to the fingers. This should be followed when using either the palms away from the body, over grip; or palms toward the body, under grip.

2. When introducing and familiarizing pupils with this type equipment, teachers should demonstrate the exercise to the entire class and then work with only a small group (6-8) at one time. Plans should be made for other members of the class to be engaged in some other activity during these periods so pupils will not waste valuable time.
3. Only the instructor should be near the performer to offer encouragement, to provide instructions, and to be ready to assist if necessary. Pupils awaiting their turn should be kept well away so the performer has sufficient space.
4. Require pupils to climb or step up to bar at the starting position.
5. To prevent blisters permit pupils only two or three turns during their first few opportunities to use the equipment.
6. Instruct pupils to drop from the equipment in proper form: Knees bent; weight slightly back; and land on the balls of the feet with a slight bounce.

THE CHALLENGE COURSE

A fine addition to any playground is a "Challenge Course". This course offers many possibilities for varied usage. These include: diagnosing particular weaknesses; practice to develop specific muscle structures; the necessary elements essential to the process of measurement; opportunity for individual and group competition; and the motivating factor of challenge as a pupil strives to improve his skill in negotiating the course and thus reducing the time required to run it.

It is located on the south side of the intermediate grades' playground and is used primarily by pupils of grades four, five, and six, but pupils of other grades are given an opportunity to become familiar with it and to negotiate the obstacles of which they are capable. Each of the fourth, fifth, and six grade classes are scheduled to run this course once a week. They may run it or play on any obstacle during their break time if they so desire. A complete description of this course and suggestions for its use are included in this booklet. This entire course was constructed locally.

The suggested course and standards were developed with the cooperation of officials in the Washington, D. C. public schools and recreation department by a committee working with the President's Council.

I. Suggestions for Construction and Layout.

1. When laying out the course it is most helpful to stretch a cord down both sides, across the ends, and one down the middle. This outline makes it easier to align the obstacles and to measure correct distances between each one.
2. The equipment should be firmly built, with care taken to avoid sharp and dangerous corners. Landings from jumps or vaults should have sufficient sand or sawdust to prevent injury.
3. The course should be 100 yards in length. If possible, the starting and finishing lines should be side by side. This makes it easier for recording time and supervising the participants.
4. All wood members used in constructing the course should be dressed on all four sides. The dimensions shown in the diagrams which follow are minimum dimensions.

5. Underground portions of wood members should be treated with creosote; portions above ground should be painted with a brown stain and wood preservative of an attractive color.
6. Wood posts may be either square or round in cross section.

II. Rules for Running the Course

1. Gym sneakers or soft rubber-soled shoes should be worn.
2. Gym clothes may be worn if desired.
3. For each obstacle bypassed or not fully negotiated, a 10 seconds' penalty will be added to the recorded time.
4. Knocking the crossbar to the ground in the hurdle (first obstacle) constitutes only partial negotiation and a 10 seconds' penalty will be added to the recorded time.
5. For the hurdle (first obstacle) the bar height should be adjusted according to the following ages:
   a. Under 10 years of age, bar height 18 inches above ground (bottom peg). Wooden dowl or peg should be 17" from ground level and the thickness of the crosspiece accounts for the other inch.
   b. 10 to 12 years of age; bar height 24 inches
   c. 13 to 14 years of age, bar height 30 inches above ground
   d. 15 to 16 years of age, bar height 36 inches above ground (third peg from the bottom).
6. Participants must grasp each rung of the horizontal ladder (absolutely no skipping of rungs permitted). They must start on first rung and finish on the last rung.
7. In negotiating the dodge post run, contestants must run from right to left around each post.
8. A 10 seconds' penalty will be added to the total score of anyone

losing balance and stepping off of the balance beam. In every case of losing balance, contestant must return to the balance beam. However, only one 10 seconds' penalty will be added to the total score, regardless of how many times balance is lost.

9. Upon beginning and completion of the handwalk on the parallel bars, hands must be placed on the outer end beyond the vertical post (18 inch overhang). Participants should be encouraged to take small hand steps and keep the body as rigid as possible.
10. Participants unable to continue must leave the course quickly and not obstruct other contestants.
11. Before negotiating the course for time, participants should have opportunity to learn the correct performance on the equipment (obstacles) and to develop sufficient endurance. Special practice may be had on obstacles that are most difficult. Two preliminary time trials may be given before recording the "official" time.
12. Each participant should engage in general, vigorous exercises as a warmup before running the course.

III. Standards of Achievement

1. The standards of achievement for the "Challenge Course" are listed for ages 10 through 17, both boys and girls; the boys use seven obstacles, the girls use six (wall climb eliminated).
2. Encouragement of Competition

Public and voluntary recreation agencies are encouraged to conduct team competition based upon aggregate performances on the course. It is suggested that teams of six or more members each of any age or sex representing any organization compete with similar teams of other organizations. Teams, regardless of location, may compete by correspondence, tele-

phone, or telegraph as long as each team performs on similar courses.

The simplest way of comparing team performances, assuming that each team is made up of the same number of individuals of similar ages and sex, is to add the individual times made by each team member; the team having the lowest total is the winner.

3. Achievement Standards for Boys

(7 obstacles in seconds or minutes and seconds)

Classification	Age							
	10	11	12	13	14	15	16	17
Excellent.....	54	52	48	44	43	42	41	40
Good.....	58	56	53	48	47	45	44	43
Satisfactory..	1:04	1:00	58	51	50	49	48	45
Poor.....	1:09	1:06	1:03	58	56	55	53	50

4. Achievement Standards for Girls

(6 obstacles in seconds or minutes and seconds)

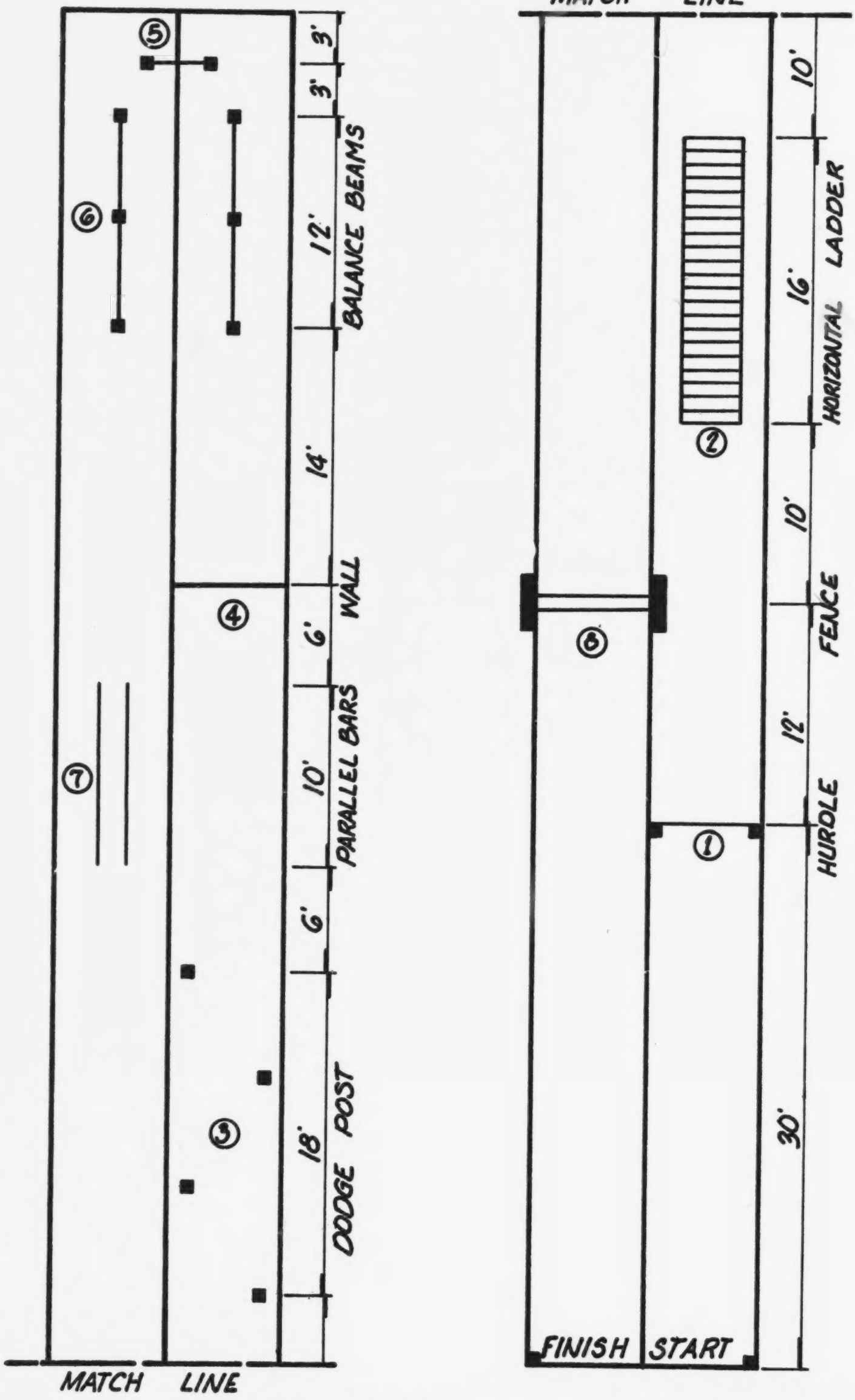
Classification	Age							
	10	11	12	13	14	15	16	17
Excellent.....	1:07	1:03	1:00	57	55	59	56	57
Good.....	1:12	1:04	1:03	1:00	57	1:01	59	1:00
Satisfactory..	1:15	1:09	1:05	1:02	1:01	1:03	1:01	1:02
Poor.....	1:20	1:13	1:12	1:07	1:06	1:10	1:09	1:07

The "Challenge Course" is within reach of all elementary schools. It can be constructed locally using materials available in each community.

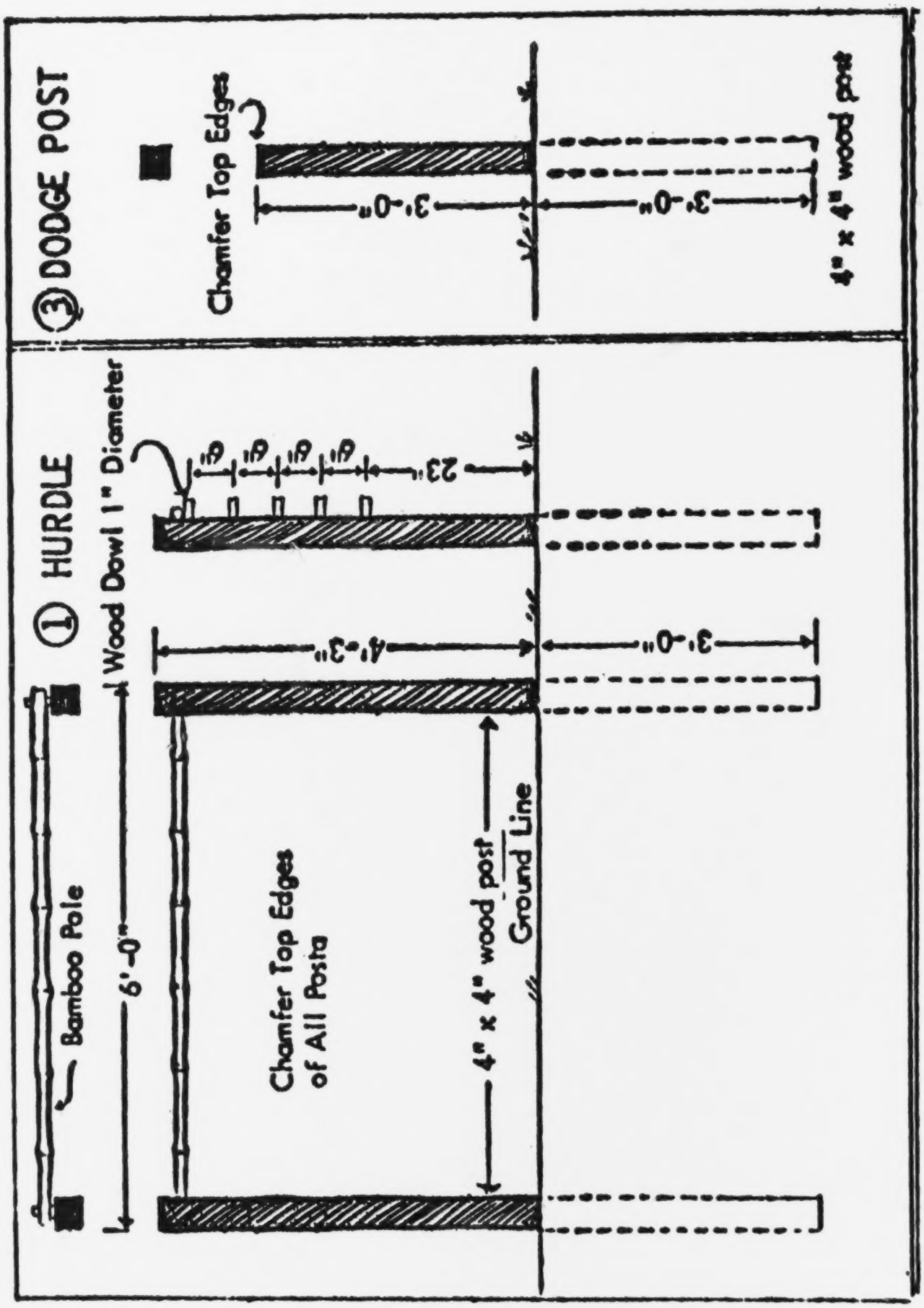
The cost of the parallel bars made locally of black pipe is approximately thirty-five dollars. The cost of the horizontal ladder is in the neighborhood of ninety dollars. The cost for materials, including top grade treated lumber, and labor for constructing the other five obstacles approximates three hundred dollars. These costs can be drastically reduced by using light or telephone poles as uprights and obtaining volunteer labor or contributions of materials from the P.T.A., parents, and other individuals. In some instances the P.T.A. has approved the construction of the entire course as a project, and in still other cases, individual parents have assumed the responsibility for the construction of a particular obstacle. All obstacles would be completed by a certain date, and a work party organized to emplace the obstacles on the course.

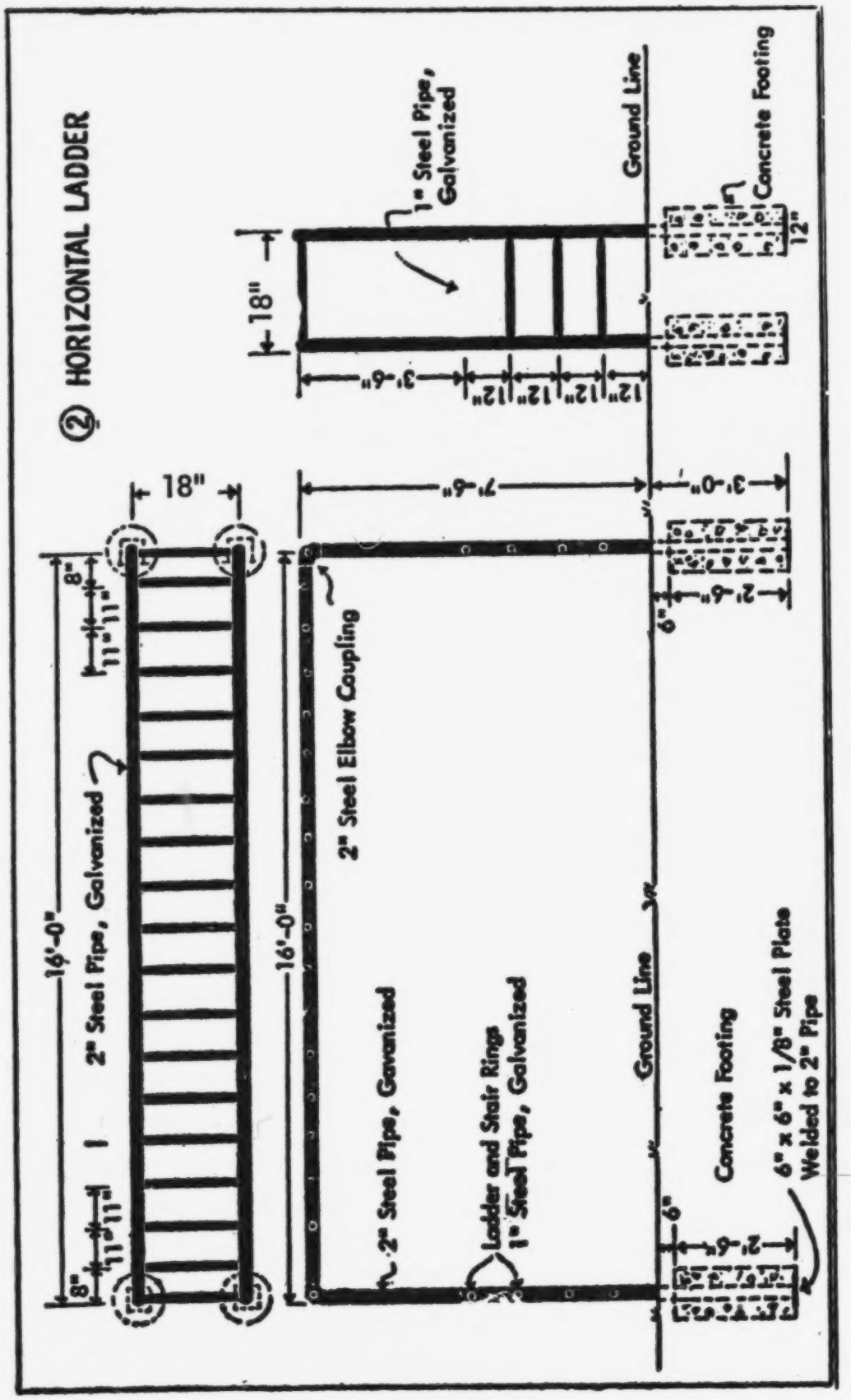
On the following pages are diagrams of the obstacles and the layout of the course.

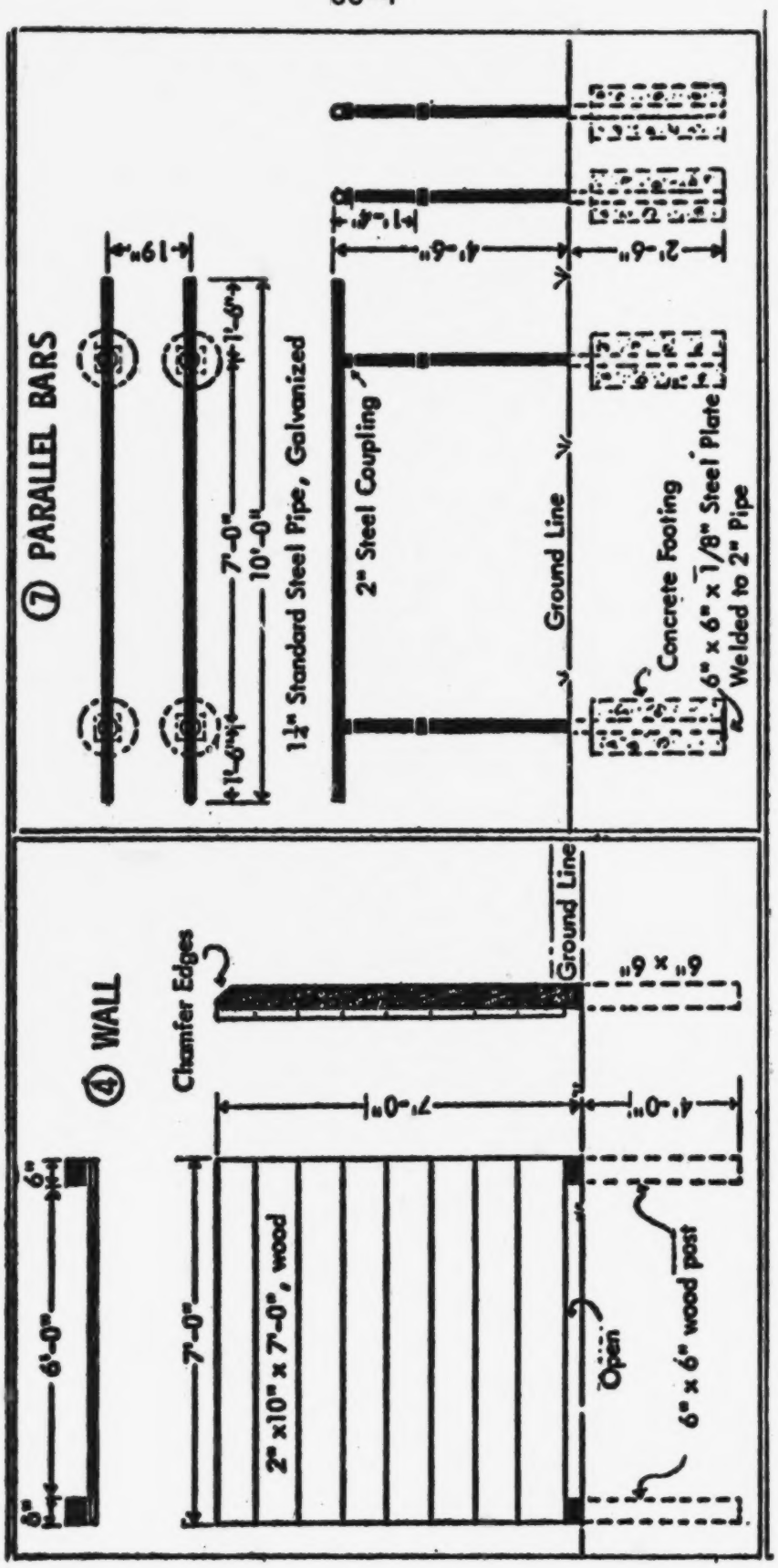
President's Council on Youth Fitness: Physical Fitness Elements In Recreation: Suggestions for Community Programs. Washington, D.C.: U.S. Government Printing Office. October 1962.

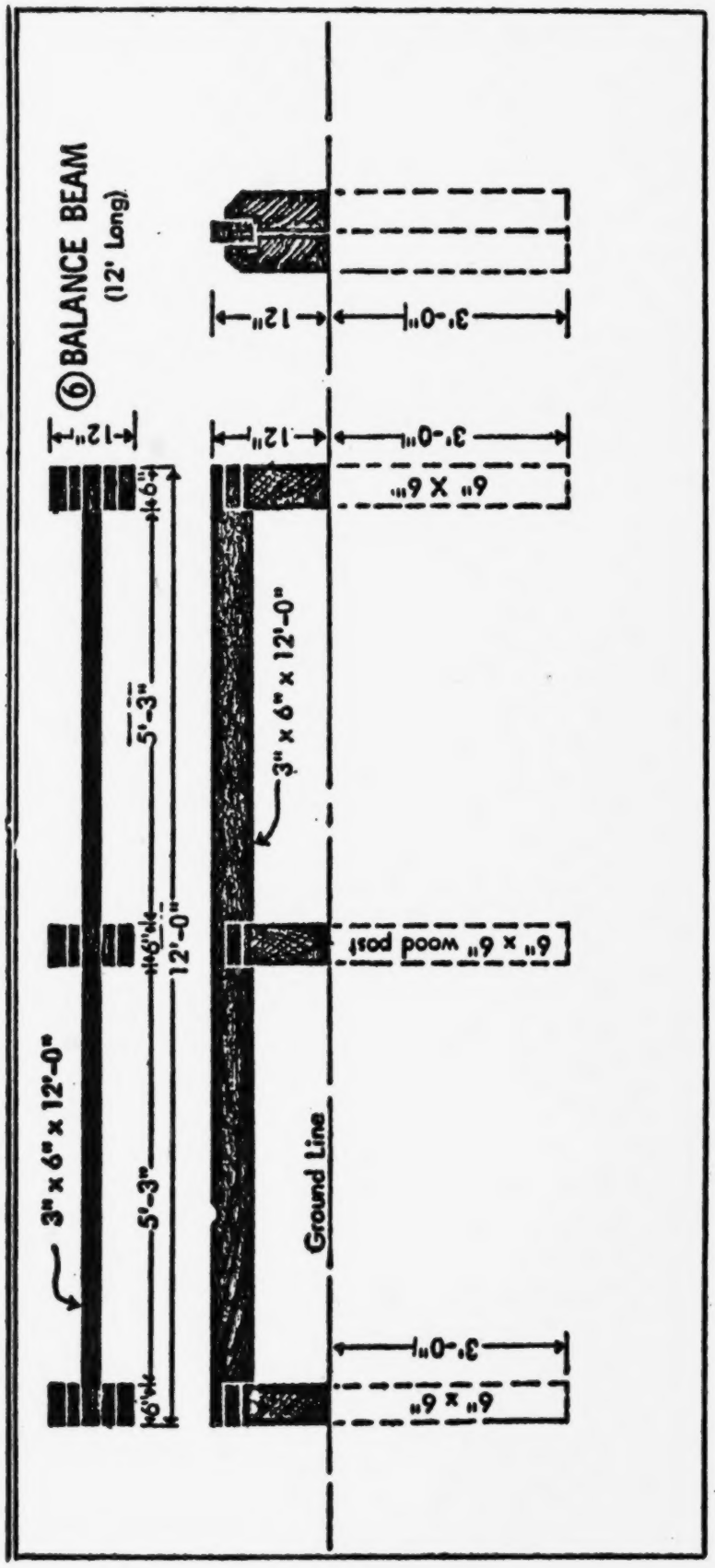


LAY-OUT PLAN OF CHALLENGE COURSE

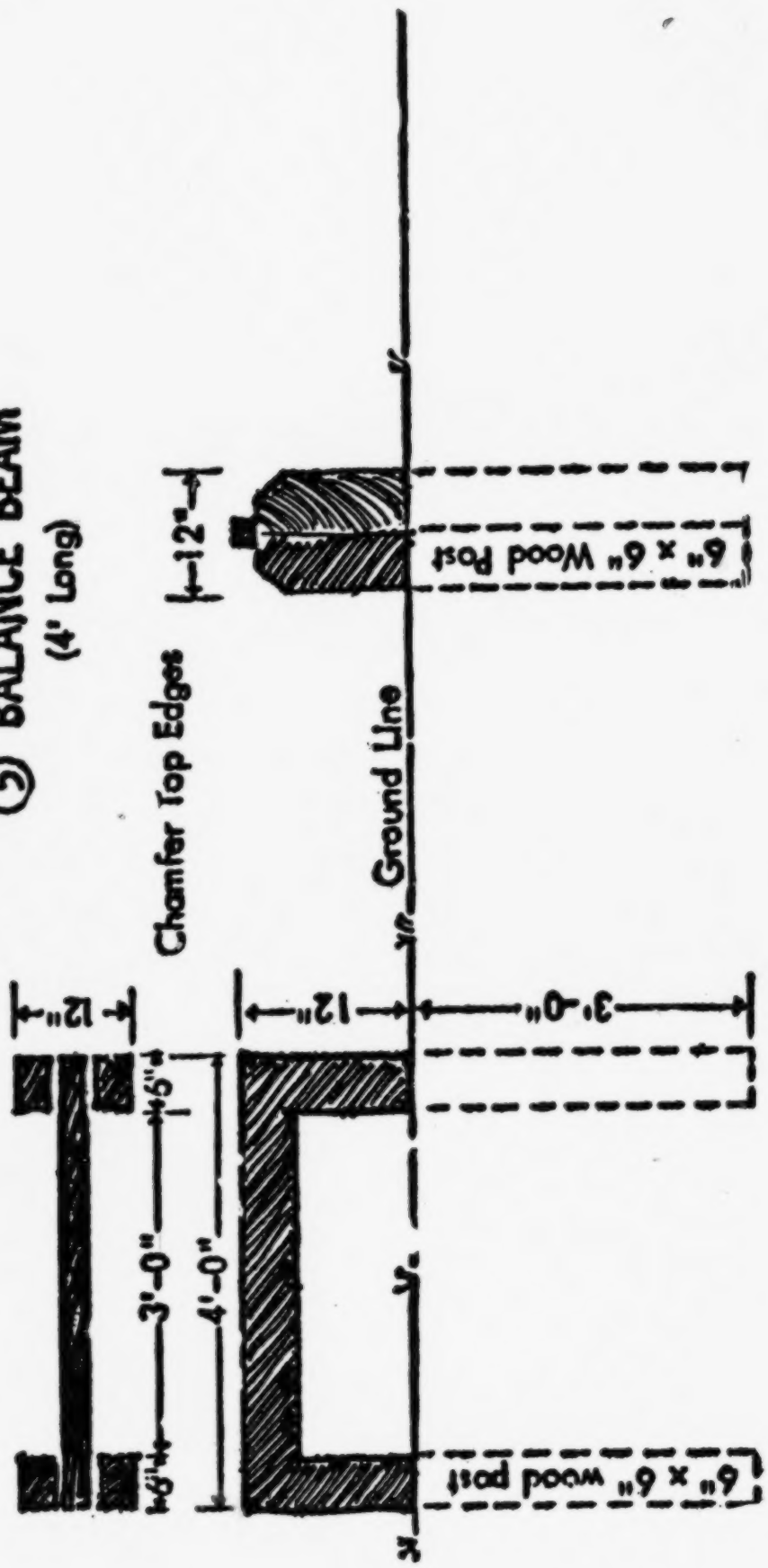

③ DODGE POST
Chamfer Top Edges
3'-0"
3'-0"
4" x 4" wood post
① HURDLE
Wood Dowl 1" Diameter
23"
4'-3"
3'-0"
Bamboo Pole
6'-0"
Chamfer Top Edges
of All Posts
4" x 4" wood post
Ground Line


② HORIZONTAL LADDER
18"
8"
11"
11"
11"
Galvanized
16'-0"
2" Steel Pipe,
1
2" Steel Elbow Coupling
16'-0"
2" Steel Pipe, Galvanized
Ladder and Stair Rings
1" Steel Pipe, Galvanized
Ground Line
6"
Concrete Footing
6" x 6" x 1/8" Steel Plate
Welded to 2" Pipe
18"
1" Steel Pipe,
Galvanized
Ground Line
Concrete Footing
12"
3'-6"
12"
12"
12"
12"
7'-6"
3'-0"
6"
9"
12"

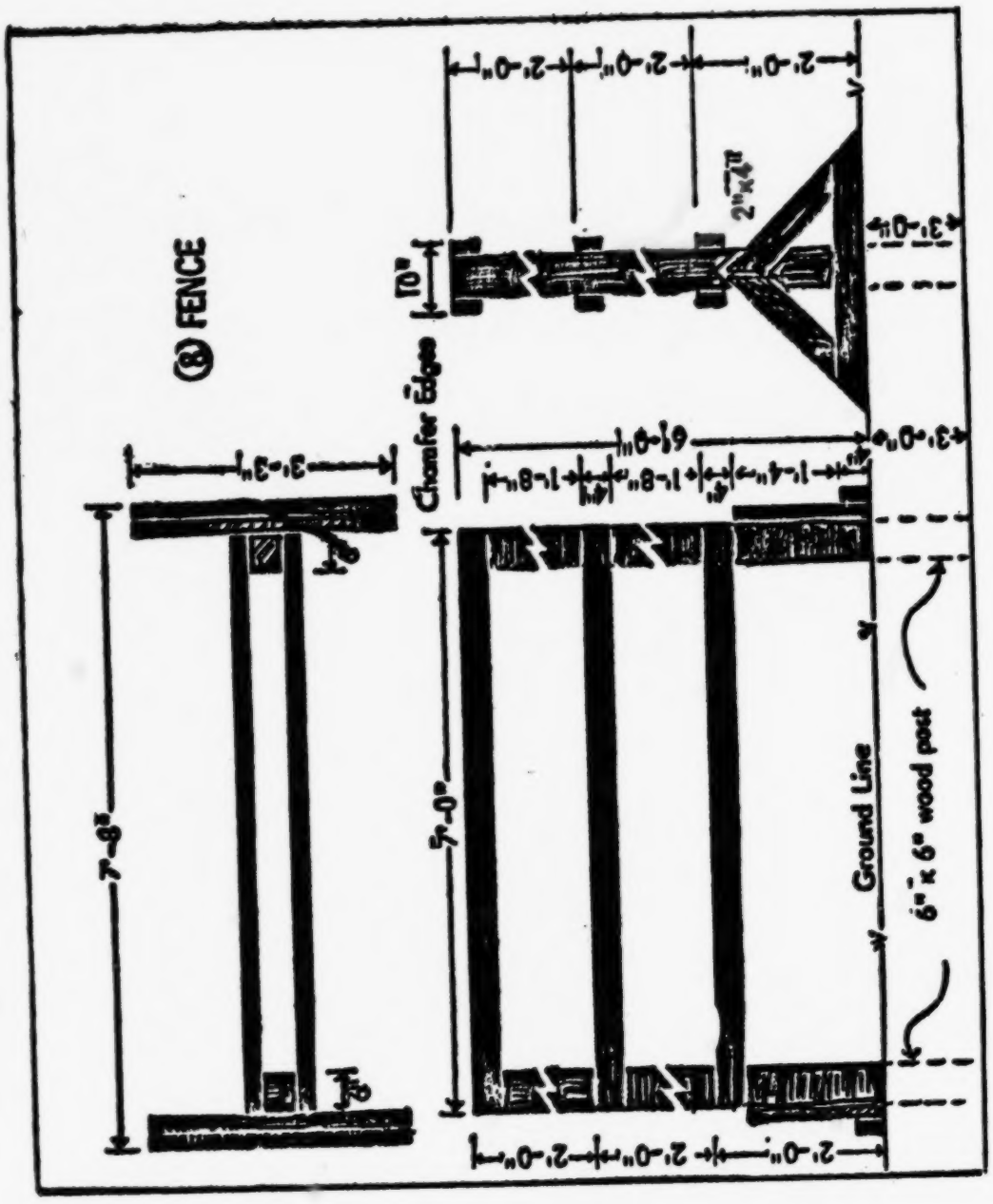

⑦ PARALLEL BARS
19"
1'-6"
7'-0"
10'-0"
1¼" Standard Steel Pipe, Galvanized
2" Steel Coupling
4'-6"
2'-6"
Ground Line
Concrete Footing
6" x 6" x 1/8" Steel Plate Welded to 2" Pipe
④ WALL
Chamfer Edges
Ground Line
6" x 6"
7'-0"
4'-0"
6"
6'-0"
6"
7'-0"
2" x10" x 7'-0", wood
Open
6" x 6" wood post


⑥ BALANCE BEAM
(12' Long)
12"
3'-0"
6" x 6"
3" x 6" x 12'-0"
6" x 6" wood post
5'-3"
12'-0"
Ground Line

⑤ BALANCE BEAM
(4' Long)

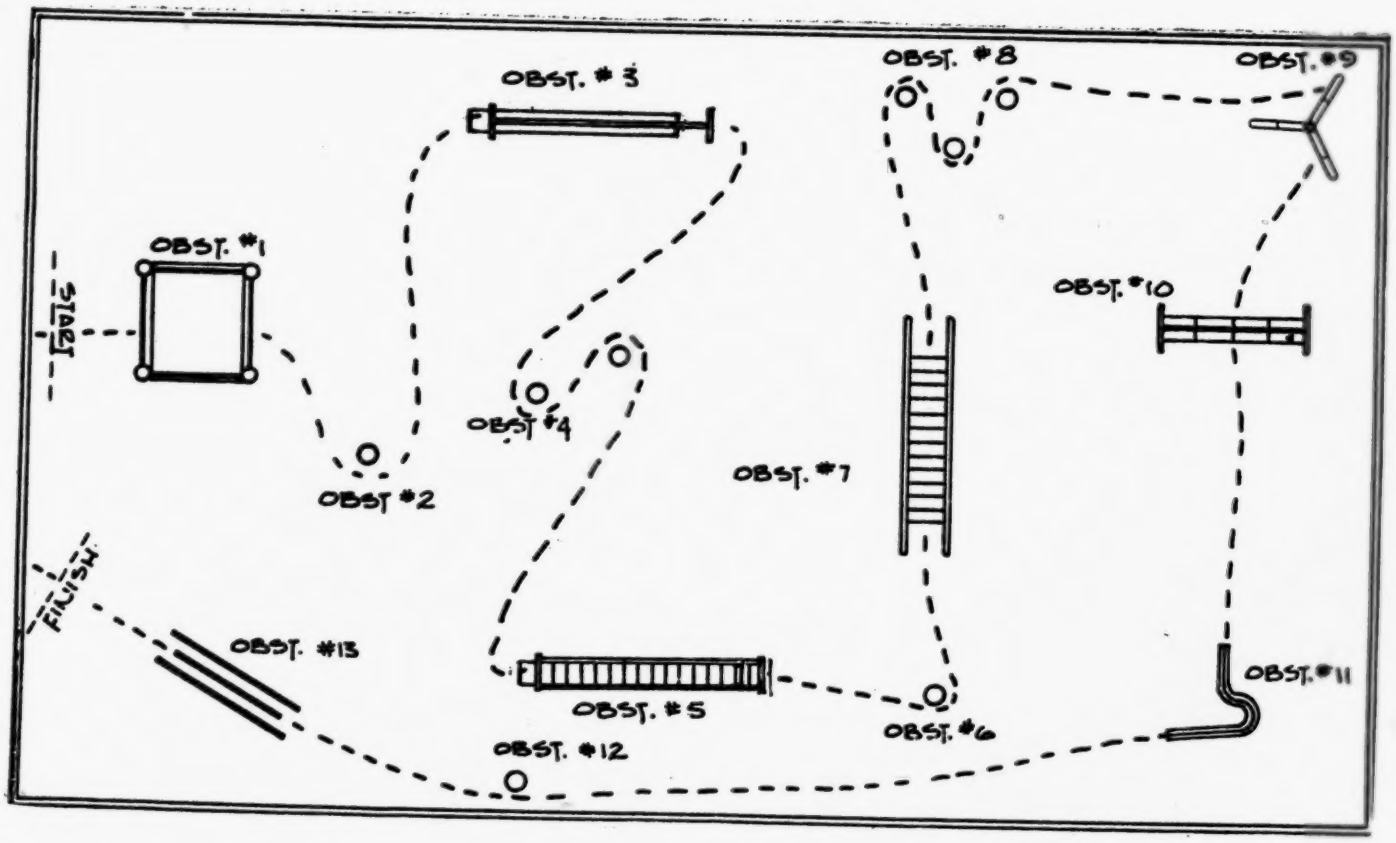


NOTE: To prevent a pupil's foot or arm being caught between the two 2" x 4" 's at each level of the fence a 2 x 6 should be nailed between them approximately 1 1/2 inches from the top. This will still permit a pupil to get a good grip on the top piece when he begins his climb.



JUNIOR OBSTACLE COURSE

On the east side of the primary grades playground is an obstacle course purchased from a commercial company, assembled and emplaced by members of the project staff. The course is run by pupils in grades one, two, and three twice a week, and is available for their enjoyment during the break periods. Intermediate grade pupils run the course once each two weeks. The name and address of the manufacturer is available from the school or project office. Teacher's manuals, containing suggestions for using the course, are available and should be requested from the company at the time your order is placed.

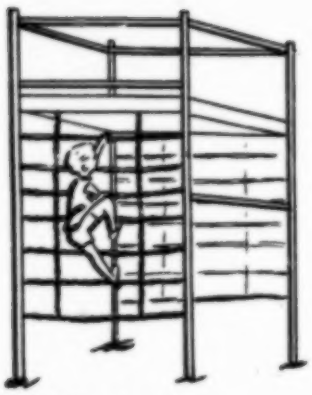


JUNIOR OBSTACLE COURSE

SUGGESTED COURSE FOR 4TH GRADERS

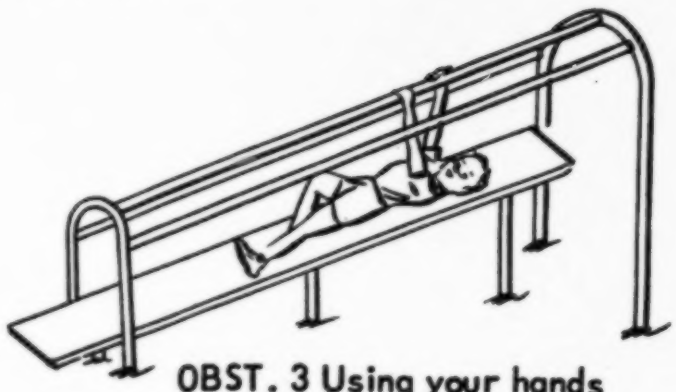
0 - 1

JUNIOR OBSTACLE COURSE



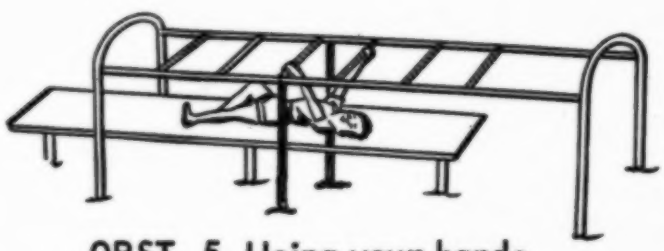
OBST. 1 Climb up and over

OBST. 2 Run around pole



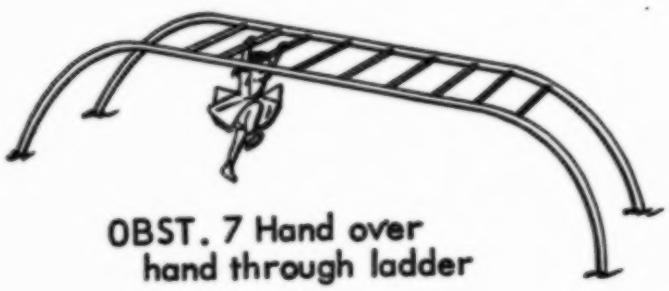
OBST. 3 Using your hands pull yourself on board

OBST. 4 Run around poles



OBST. 5 Using your hands pull yourself on board

OBST. 6 Run around pole



OBST. 7 Hand over hand through ladder

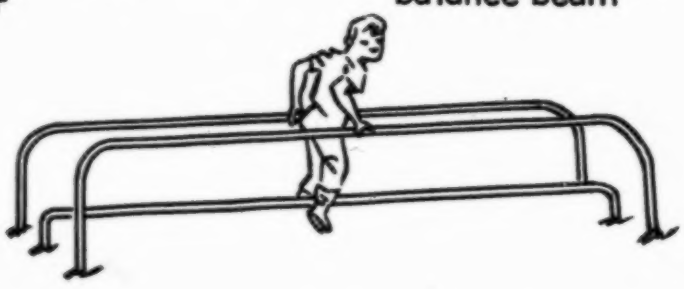
OBST. 8 Run around poles

OBST. 9 Climb to white line

OBST. 10 Climb up and over

OBST. 11 Walk the balance beam

OBST. 12 Run around pole



OBST. 13 Walk the balance beam using handrails

HARD SURFACED AREA

The hard surfaced area is 200' by 76' of actual game area space plus a six foot border on the slopes tapering from a thickness of two inches to one inch on the edge to prevent erosion. The limerock base is five inches thick placed on a solid sub-grade. The surface is Type I asphaltic-concrete as specified in the Florida State Road Department manual. Type II asphaltic-concrete is less expensive than Type I, and makes a somewhat smoother surface. However, Type I is more durable because it compacts to a harder density. Costs vary in different locales depending on such factors as availablity of the base material and the distance it and the asphalt must be hauled. Prices range from $2.00 - $2.50 per square yard for Type II and from $2.25 - $2.75 for Type I. These approximate prices include the preparation of the sub-grade; hauling, mixing, and shaping the base; and placing and leveling the asphalt. The cost of construction can be greatly reduced if through the cooperation of a local agency of government the sub-grade can be prepared, and the base material placed on the site. This would reduce the cost by approximately a dollar per square yard. The bid price would not include, unless specified in the invitation to bidders, the painting of boundary lines. There are companies who offer this service or lines can be painted by stretching two cords three inches apart and painting between them or making a wooden frame with the boards spaced the width, if not three inches, of the desired line and painting between them.

This area will be used for basketball, rhythms, and small and large group games. The basketball goals on one court will be placed eight feet high and nine feet on the other court.

TETHERBALL COURTS - 1

The tetherball courts are in constant use especially by pupils in grades three through six. The pipe can be purchased ready to be emplaced or a local welder can cut a pipe the proper length and weld the hook at the top of the pipe for attaching a chain. A concrete base is not essential, but its advantages are obvious. Six courts were constructed and a court designated for each grade. A player who loses goes to the rear of the line to await another turn while the winner is permitted to play another game after which, win or lose, he moves to the rear of the line.

A concrete base, if poured, should be 12' in diameter and 4" thick with at least 3" above-ground level. This will help to keep sand off the court. The circle can be marked off and strips of plywood or masonite nailed to short stobs will make excellent forms.

A copy of the rules is sent with each ball. A 4' chain suspended from the hook on the top of the pole makes it easy to hang the ball. This is done by attaching one end of three foot nylon cord to the eye of a snap hook and the other end to the ball itself. The ball can then be put up each morning and taken down each afternoon with a minimum of effort.

The cost of the completed court and ball is approximately $77.00. The cost of the pole and a good ball is approximately $21.00.

CIRCUIT COURSE

The "Circuit Course" is located on the east side of the intermediate grades' playground with the obstacles placed thirty-eight feet from the fence. This course is used primarily by the upper grade pupils. Each of these classes is scheduled once a week for the course

and pupils, in large number, can be observed on the equipment whenever there is an opportunity throughout the day.

Classes are divided into squads and each squad initially is assigned to a particular piece of apparatus. Each squad consists of seven or eight pupils and a squad spends approximately one minute at each piece of apparatus before the instructor gives the signal to advance to the next station.

On the parallel bars a pupil is supposed to cross each set in the straight arm support position. At the horizontal bars each pupil is instructed tc "chin" as many times as possible using the "thumbs in grip". They may cross the "Icicle" by facing side ways or forward as they advance one hand then the other from bat to bat. They hand walk the giant ladder, climb one of the two peg boards, and then it's a turn on the ropes to ring the bell. At the seventh station, they walk both of the ladders, and on the tripod they climb one of the pipes using arms and the legs only if necessary. In approximately eight minutes sixty pupils have been through the entire course. On the day the boys are scheduled to use this apparatus, the girls run the "Challenge Course" and vice versa.

A detailed description of each piece of the apparatus on the course is included as well as a diagram which we hope will prove to be useful to those who plan to construct all or different pieces of the apparatus. The cost given is, of course, approximate and will vary from community to community. The number listed by the name of the equipment corresponds to the diagram of the same number.

In addition there are a number of activities listed that pupils can become skilled in when a piece of equipment is used as an individual teaching station.

It is hoped that additional apparatus will be added to the Melrose Park Elementary School playground. If so, diagrams will be made available for inclusion in this booklet.

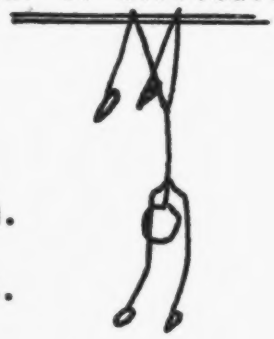
PARALLEL BARS - 2

Use of these bars will develop upper body and arm strength. All three sets are made of 2" pipe for the uprights and 1 1/4" pipe for the cross bars. The straight, level set is 4'6" from ground level and the width of the bars is 19" center to center. The uprights are placed a linear distance of 7' apart which means the 10' crosspiece will extend 1'6" beyond each upright. The diagram for this set is the same as that shown on diagram CC-4 underthe section on the "Challenge Course".

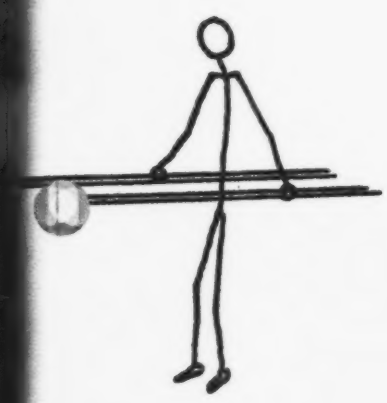
The elevated set begins at a height of 4'6" and rises to 5' before slanting back to 4'6". The elevation is obtained by heating the pipe and bowing it. The width is 19" measured center to center.

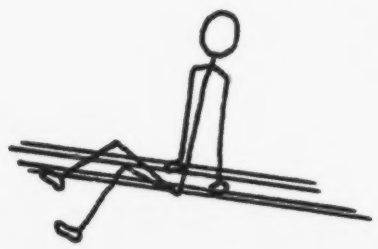
The expansion bar begins at a height of 4'6" and a width of 19". It expands to a width of 30" and rises to a height of 5'6" at the other end. These sets are more difficult to cross and present a greater challenge and a sense of achievement to those pupils who are able to cross them using the straight-arm support.

The approximate price constructed locally is $35.00-$45.00. A few skills to learn on the parallel bars listed in order of difficulty are:



1. Hang and drop from bars.
2. Travel across bars while hanging between them.
3. Travel across bars using straight arm support.
4. Double knee hang from one bar.
5. Straddle seat
6. Straddle seat travel
7. Front vault dismount





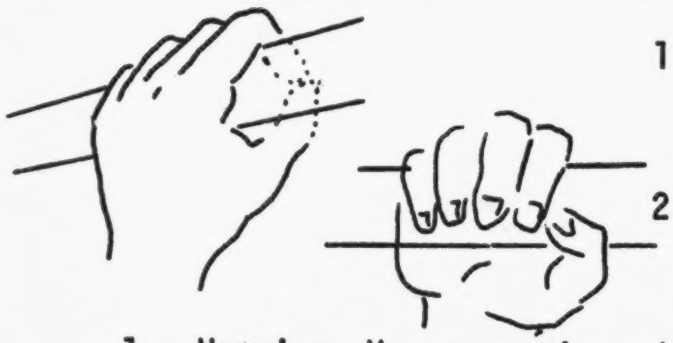
Discarded tires half buried in the ground in front of the bars at the starting position provide a support from which a pupil is able to assume the proper position on the bar.

HORIZONTAL BAR - 3

The use of the horizontal bar is one of our best means of developing arm, shoulder and abdominal muscles, as well as physical courage. Children should have many opportunities to use these bars so that their strength may be developed through the continued repetition of the activities learned.

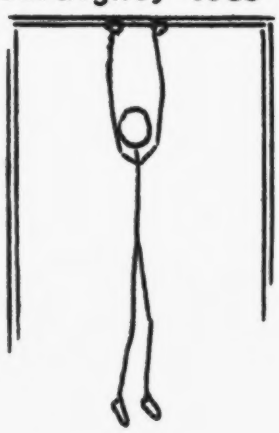
Good form should be stressed. The feet do not "dangle" - ankles should be extended, toes point. The head should be held up. Children should understand that inverted hanging stunts may not be done without a spotter standing by.

THE GRIP. In grasping the bar the thumb should be wrapped around the bar in the opposite direction from the fingers. A grip in which the thumb is kept alongside the palm is not effective. The activities listed here use one of the following two grips:

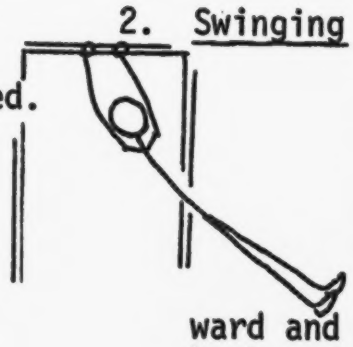


1. Overgrip - thumbs toward each other, palms away from body
2. Undergrip- thumbs pointing outward, palms toward body

1. Hanging Use overgrip and hang with legs and arms straight, toes extended.



2. Swinging



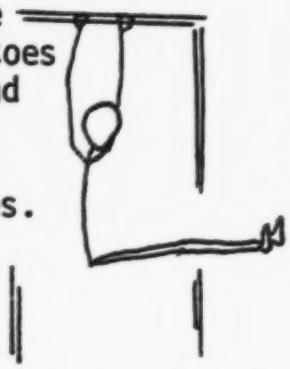
Use overgrip. Bend the elbows almost to right angles, at the same time raising the knees. Force the hips forward, extending the legs upward and outward. Then swing backward and dismount at the end of the backward swing, or continue to swing forward and back. Not too long!

3. Knee Raising

Use undergrip. Raise one knee, and lower toes pointed. Lower it and raise the other knee.

Try raising both knees.

4. Lever



Use undergrip. Raise one leg straight forward, extending knees and ankles. Lower it and raise the other leg.

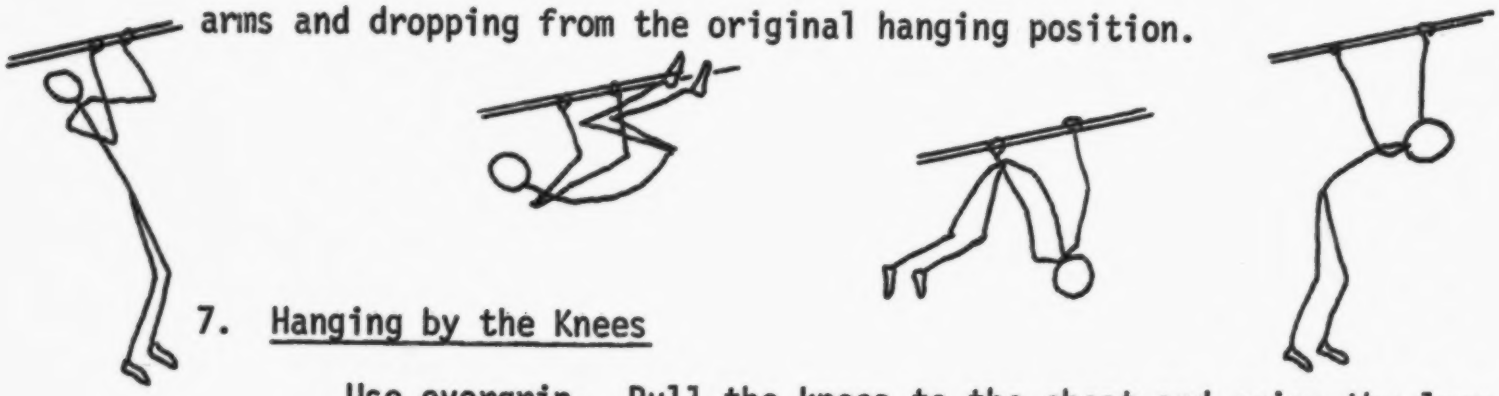
Raise both legs straight forward. (Lever)

5. Chinning

Use overgrip. Slowly bend the elbows until the body is pulled up high enough to put the chin over the bar. If a child has difficulty in pulling himself up, lift him into position and ask him to lower himself slowly.

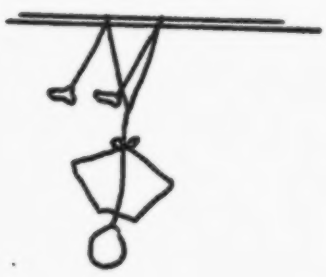
6. Skin the Cat

Use undergrip. Bend elbows to right angles, at the same time bringing the knees to the chest. Lower the head and swing the legs between the arms. Release the hands and drop to the ground, landing with the knees flexed; or reverse the trick, pulling the legs back throught the arms and dropping from the original hanging position.



7. Hanging by the Knees

Use overgrip. Pull the knees to the chest and swing the legs between the hands and over the bar. When the knees are securely hooked, release the hands and hang down.



CAUTION: A child may be able to get into this position and still not have the strength to pull himself back up. Be sure to have a spotter standing by!

8. Bars of varying heights are needed to provide for the differences in the size of pupils. The heights specified in the diagrams have been found to be practical.

These bars built locally according to this design cost $50.00.

ICICLE - 4

The use of this piece of apparatus will develop grip and upper arm strength. A great effort is required to travel the sixteen feet across the bats.

The two ladder shaped upright frames 18" wide are made of 2 1/2" pipe and the rungs of 1" pipe. The first rung should be 24" above ground level, and three additional rungs spaced 12" center to center. The top rung serves as a brace and should be flush with the top of the uprights. It is made of 2 1/2" pipe and is 48" above the rung immediately under it. The sixteen foot 3" cross pipe is welded to the top of these frames. "Eyes" made of a 1/2" rod should be welded at 12" centers across the top of the cross pipe. These will prevent the wires attached to the bats from slipping along the pipe. A 1/4" hold should be drilled through the bat handle about one inch from the cut off end to accept a steel wire. The bats should be long enough to permit a pupil to get a good grip (6-8 inches) and should not hang lower than 8-10 inches from the underside of the cross pipe. Skills on the Icicle include:

1. Moving forward by advancing one hand then the other.
2. Moving across while facing sideways.
3. Cross in the "flexed arm position".
4. Turning a complete circle on each three bats.

The approximate cost of this piece of apparatus is $85.00

HORIZONTAL/GIANT LADDERS - 5

This type equipment is designed to develop upper body and grip strength. It, also, provides opportunity for development of locomotor agility of the hands, arms, and shoulder girdles.

SKILLS LISTED IN SEQUENCE OF DIFFICULTY

1. Hang with both hands from same rung of ladder with thumb around the bar touching the tip of the fingers.
2. Travel across ladder in sequence with right hand leading, bring left hand up to right. Continue same with left hand leading.
3. Travel along side of ladder, hand to hand.
4. Travel forward with one hand on each side of the ladder.
5. Travel across ladder with one hand on one rung and the other hand advancing to the next alternating right and left without both hands simultaneously gripping the same bar. Body should be kept straight and not swing from side to side.
6. Hang from ladder, raise both knees to chest and hold for three seconds or longer.
7. Upper grade pupils can attempt to travel across backwards.
8. More highly skilled pupils can travel across ladder while raising the legs to a 90° to the hips. When in this position the body will be in the shape of an "L".
9. In addition to the above activities, the giant ladder is adapted to races or relays.

Diagram CC-3 gives the dimensions and specifications for the horizontal ladder. Approximate cost is $90.00.

The giant ladder is forty feet long and four feet wide. The first section is nine feet high; the second section rises from a height of

nine to eleven feet; the third section slants from eleven down to nine feet; and the fourth section is nine feet. The uprights and cross rails are made of 2" pipe and the rungs of the ladder are made of 1" pipe spaced 12" apart.

The cost of this ladder is approximately $250.00 emplaced.

THE PEGBOARD - 6

This piece of equipment is used for the development of the upper body and grip strength. There are many different patterns of hole arrangements that can be designed to present difficult challenges to pupils. These boards are 2" x 12" x 72" and contain thirteen 1 1/4" holes.

The lower edge of the straight board is 6 1/2' above ground level. The uprights are 3" black pipe with a piece of angle iron 2" wide welded to the pipe so the lower edge of the board will rest on it and most of the weight will be supported by it. Two bolts 1/2" x 8" are used to attach the pegboard to one side of the upright and two 2" x 4"'s to the opposite side. To this frame another 2" x 4" can be nailed to prevent the pegs from extending too far and to provide a support on which to nail a 1" x 8" board that will cover the top of the pegboard and protect the pegboard from rain. Another way to provide water-shed is to angle cut the top of the boards. Conduit the same size as the holes can be driven in them to serve as liners.

The other pegboard is placed on a slant rising from a height of 6 1/2' to 8'.

Pupils make the trip across by supporting the body weight while gripping one peg, advancing the other peg to the next hole, transferring the weight to that peg, advancing the other peg, and continuing on across.

The cost of one pegboard and frame is about $70.00.

ROPE CLIMB - 7

The rope climb serves to develop upper body, abdominal strength, and coordination. The eight rope climbing rig has a twenty-one foot upright of four inch black pipe with 17' above ground level. Four arms of one inch black pipe are welded to the upright one foot below the top. (A) A one-half inch rod passes over the top of the upright, through a notch, and is welded at each end of the bar. (B) The hooks are made of one-half inch rods welded around the bar and curved to provide a two inch opening and three inch well. (C) The upright is set in four feet of concrete poured to a three foot diameter. Two one-half inch reinforcing rods three feet long are passed through the upright at a three foot depth. In lieu of these rods a large truck wheel can be welded to the upright about 18" from the bottom. The entire upright is filled with concrete for extra strength.

As easy method of hanging or removing ropes is to place a coat hook on a fourteen foot 2 x 2.

Pupils can learn to:

1. Climb hand over hand using feet and legs
2. Climb hand over hand with legs straight down free of rope
3. Climb hand over hand with legs at a 90° to the trunk
4. Climb with one hand grasping one rope and the other hand an adjoining rope
5. To reverse hang
6. Climb bicycling style

The approximate cost of this climb emplaced is approximately $162.00. Ropes 15' in length and 1 1/4" in diameter with a metal hook cost about $25.00 each.

The rope climb on the primary grades' playground was made by emplacing

three light poles in a triangular pattern approximately 8' apart center to center measurement. Three inch pipe is used as the cross piece from which the ropes are suspended. They are secured to the poles by 5/8" bolts. The pole is notched to support the pipe and the pipe bolted to the pole. A 2" "eye" should be welded on the top of the pipe at mid-point through which the rope can be passed to prevent it sliding across the pipe while a pupil is climbing the rope. Platting is a very good way to attach the rope to the pipe. For primary grade pupils the ropes should be placed at a height of approximately 12' and for intermediate grade pupils a height of 15 or 16 feet is recommended. Poles should be placed in the ground five feet.

If the poles can be obtained from a utility company or contractor, the cost of this type of climb would be approximately $45.00. The 1 1/4" rope sells for $1.00 - $1.25 per foot and 1 1/8" rope slightly less. The 1 1/8" diameter rope is large enough for the primary grade pupils.

Some means of securing the ropes at night should be considered. One way is to run a chain through a loop on the end and lock the chain to a hook placed at a height of six or seven feet on one of the poles.

TRIPOD - 8

The tripod develops upper body strength and coordination. Pupils who are unable to climb the ropes will find it helpful to work on the tripod.

On the tripod pupils can:

1. Climb pipe using arms and legs
2. Climb pipe using arms only
3. Climb up one pipe and down a different one

Three joints of 1 1/2" pipe are needed to construct the tripod.

Holes about 2' deep dug 20' apart in a triangular pattern will permit the pipes to form an angle of approximately 40° to the ground. Pipe should be notched so it fits close at the top and a strong weld can be made at the apex.

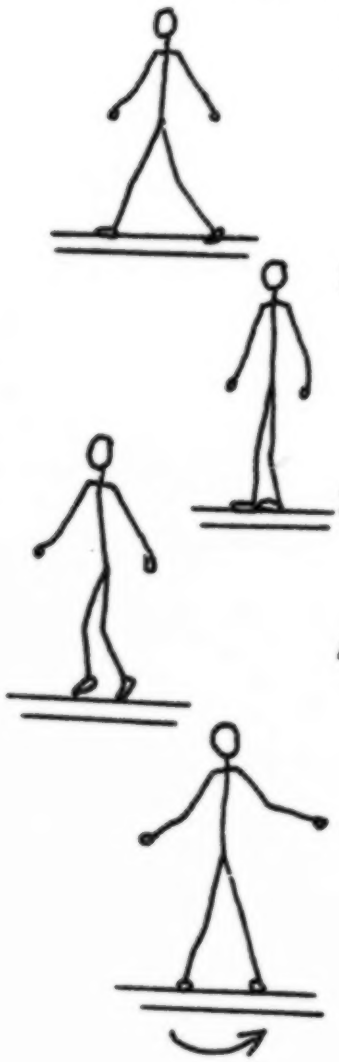
The approximate cost of the tripod is $55.00 emplaced.

BALANCE BEAM - 9

The balance beam on the challenge course can be used, or a portable beam such as can be made of the components of a Lind Climber. Portable beams must be stabilized and mats should be placed along the side for difficult stunts.

Children have little opportunity in this modern age to enjoy the pleasure of balancing precariously along the top of a rail fence, but they can get the same pleasure, and develop the same skill of body balance and coordination, through the use of the balance beam.

The activities listed here are only a few of the many possibilities.



1. Natural walk. Walk forward with a natural step, heel striking the beam first, arms extended sideward for balance. Try it with arms folded at chest.
2. Follow step. Step forward with one foot, close the other foot to it, step forward again, close again, and so on.
3. Tip-toe walk. Rise on the toes and, keeping knees straight, walk the length of the beam.
4. Reverse. Walk forward to the center of the beam and then backward to place. Have a line of children at each end of the beam for this one. A child from one end walks forward. When he is ready to go backward, a child from the other end gets on the beam and walks forward.

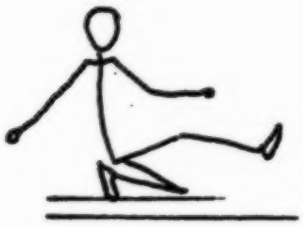
5. High Stepping horse. Step onto the beam with the L (or R) foot. Raise the R knee to chest and step forward onto the R foot. Raise the L knee to chest and step forward onto the L foot and continue in this manner.

6. Cat walk. Walk across the beam on all fours, Moving alternate hand and foot at the same time.

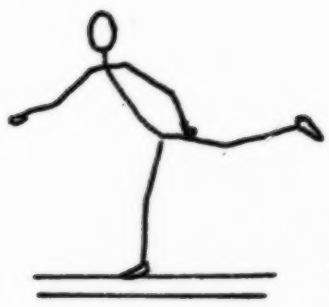
7. Duck walk. Squat down at one end of the balance beam with fists in armpits. In this position travel forward, putting one foot ahead of the other on every step.

8. Kneel. Walk to the center of the beam, kneel on one knee, rise and continue forward, or do a half-turn and return to starting position.

9. One-leg squat. Walk to the center of the beam. Raising one leg forward, bend the supporting knee until sitting on the heel. (Be sure to keep supporting heel in contact with the beam.)



10. Swan Stand (Scale). Stand on one leg. Slowly tip the trunk forward, at the same time extending the arms forward and raising the other leg backward. Then move the arms out sideward and upward.

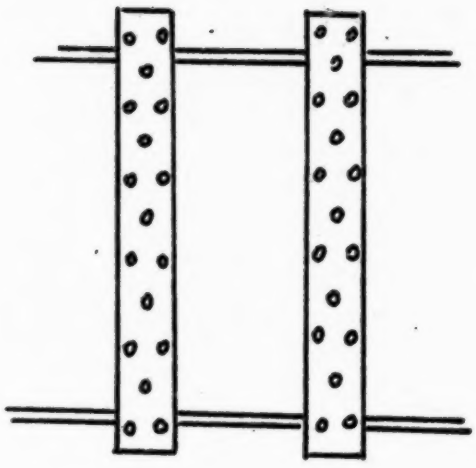


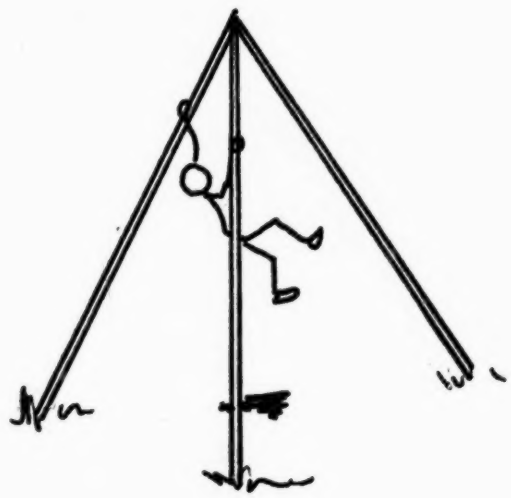
11. Skip, gallop or step-hop. When the children are fairly sure-footed in the foregoing stunts, they may try these locomotor movements in which the support leaves the beam momentarily;

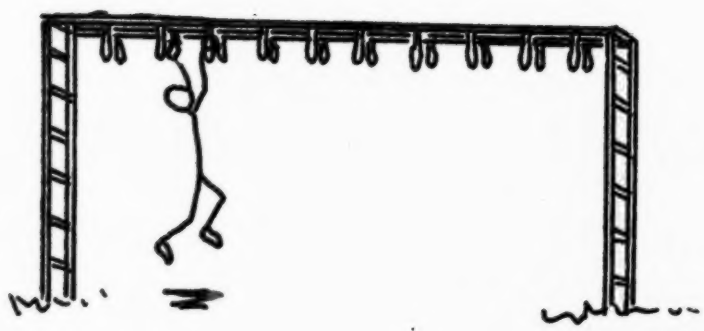
(Balance Beam - Continued)

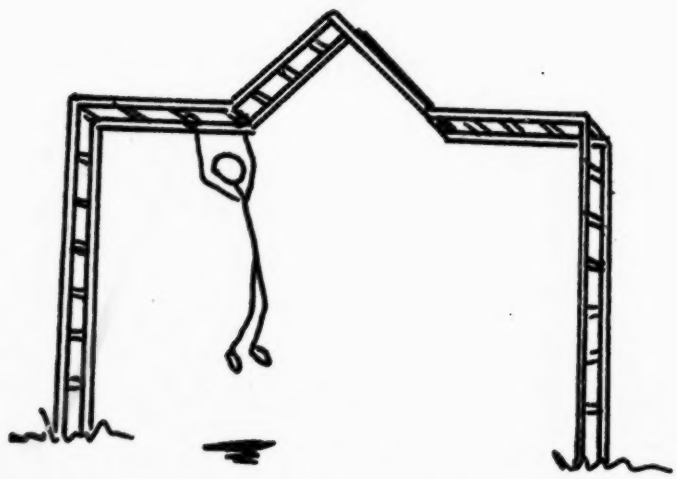
Some Sample Combinations

1. Walk to the center, do a half-turn, kneel and rise, do another half-turn, kneel again and rise, then walk to the other end.
2. Step-swing, step-swing, step knee-up, step knee-up.
3. Walk to the center, do a swan stand, swing the back leg forward, do a one-leg squat, rise, and continue forward with a walk.









APPROXIMATE COST OF BLACK STRUCTURAL PIPE

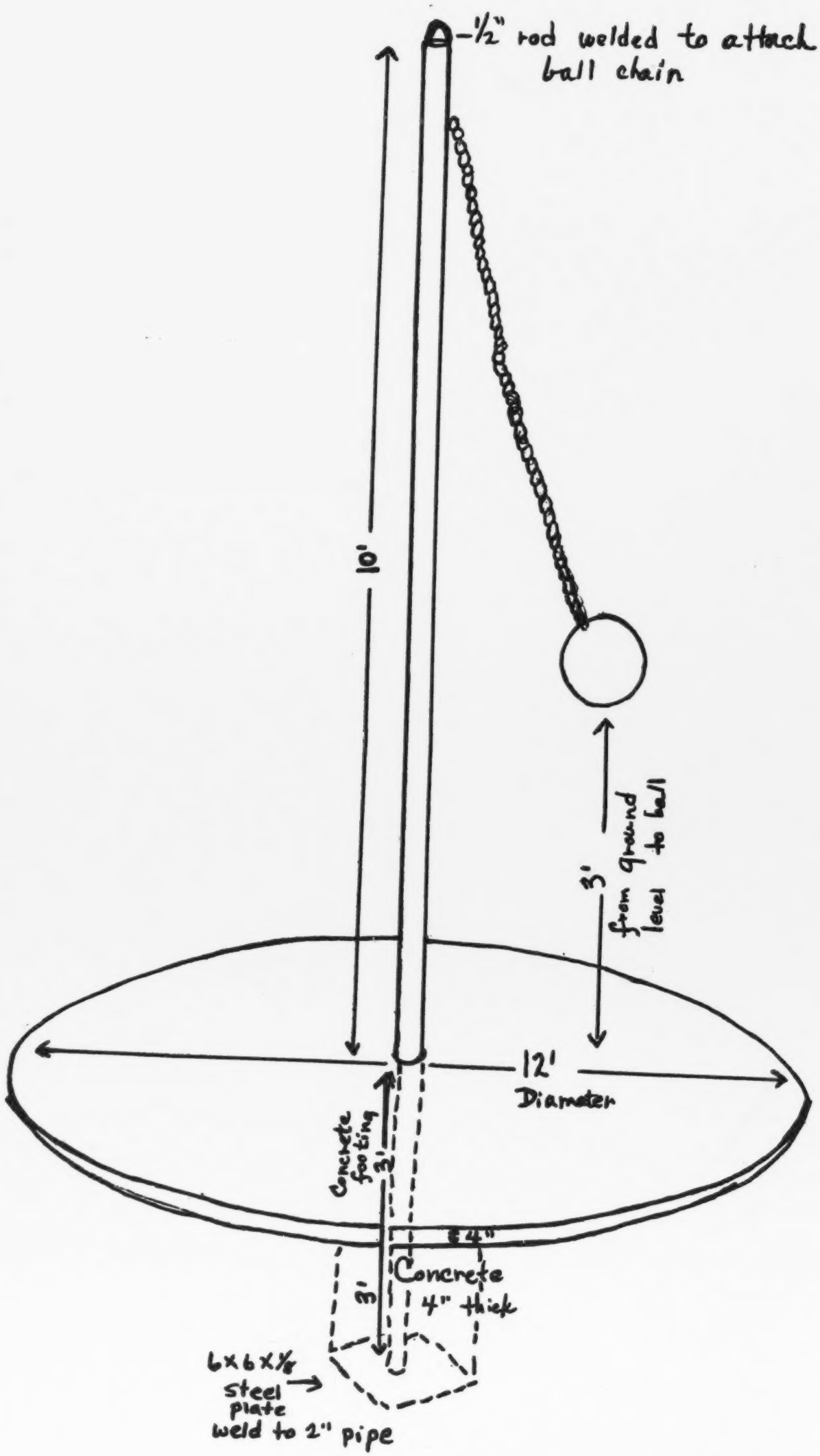
This information is included to serve as a guide if someone desires to determine the amount of pipe needed and the approximate cost.

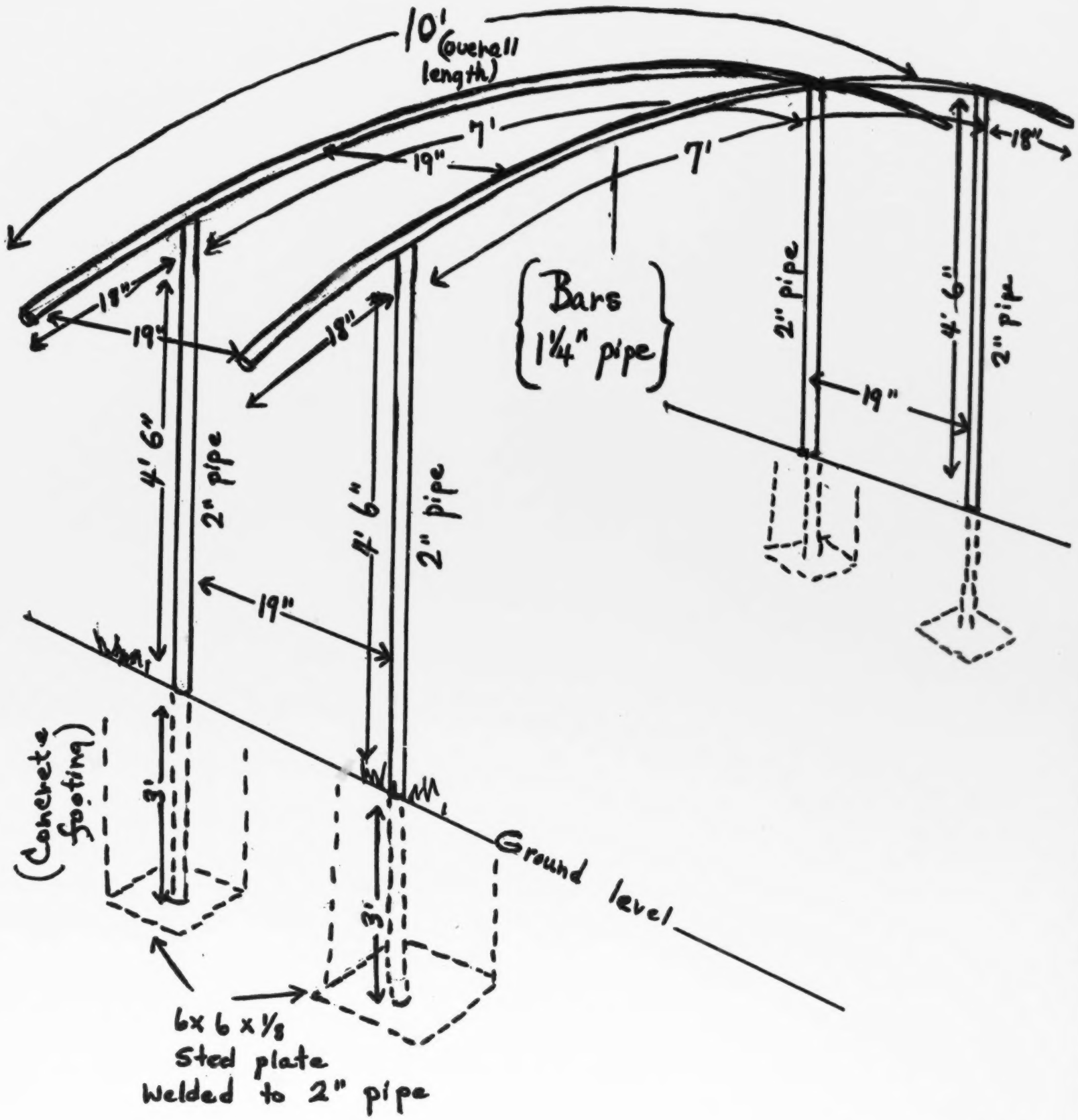
Diameter	Price Per Foot
Three-fourth inch	.19 - .32
One Inch	.25 - .44
One & One-fourth Inch	.32 - .59
One & One-half Inch	.38 - .70
Two Inch	.50 - .94
Two & One-half Inch	.75 - 1.46
Three Inch	.93 - 1.90
Four Inch	1.32 - 3.04

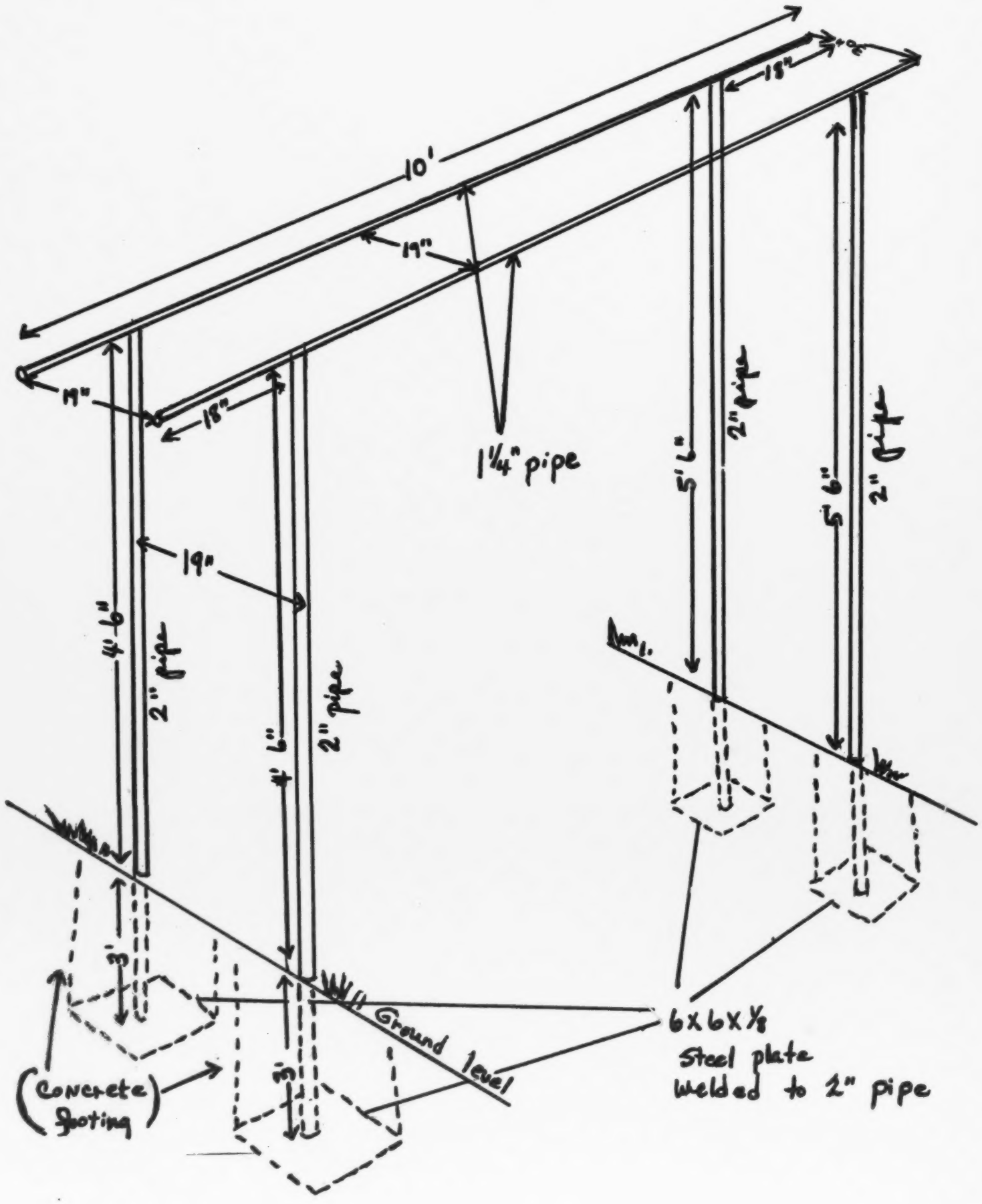
Structural black pipe is less expensive than galvanized, is considered stronger, and is easier to weld. Also, the paint used on galvanized costs more than paint which will bond to black pipe. For these reasons black pipe is recommended for construction of apparatus. The prices listed above in the left colum apply when pipe is purcased in twenty-one foot joints and the figure on the right reflects the cost when pipe is cut to a specified length. It is important that exact needs for a particular size of pipe be determined in advance of purchase. Since pipe is usually sold in twenty-one foot joints, lengths needed divisible into 21 with a small remainder would enable a purchaser to affect a considerable savings.

On pieces of equipment requiring a number of welds, it is most likely that it would be cheaper to have a local shop furnish both the pipe and labor unless an interested patron donated his service.

TETHERBALL COURTS - 1




10' (overall length)
7'
19"
7'
18"
18"
19"
18"
Bars
1¼" pipe
2" pipe
4' 6"
2" pipe
19"
4' 6"
2" pipe
19"
(Concrete footing)
3'
3'
Ground level
6x 6 x ⅛
Steel plate
Welded to 2" pipe


10'
19"
3"
18"
1¼" pipe
18"
3"
5'6"
2" pipe
5'6"
2" pipe
19"
4'6"
2" pipe
4'6"
2" pipe
3'
3'
Ground level
(Concrete Footing)
6x6x⅛
Steel plate
welded to 2" pipe

HORIZONTAL BAR - 3

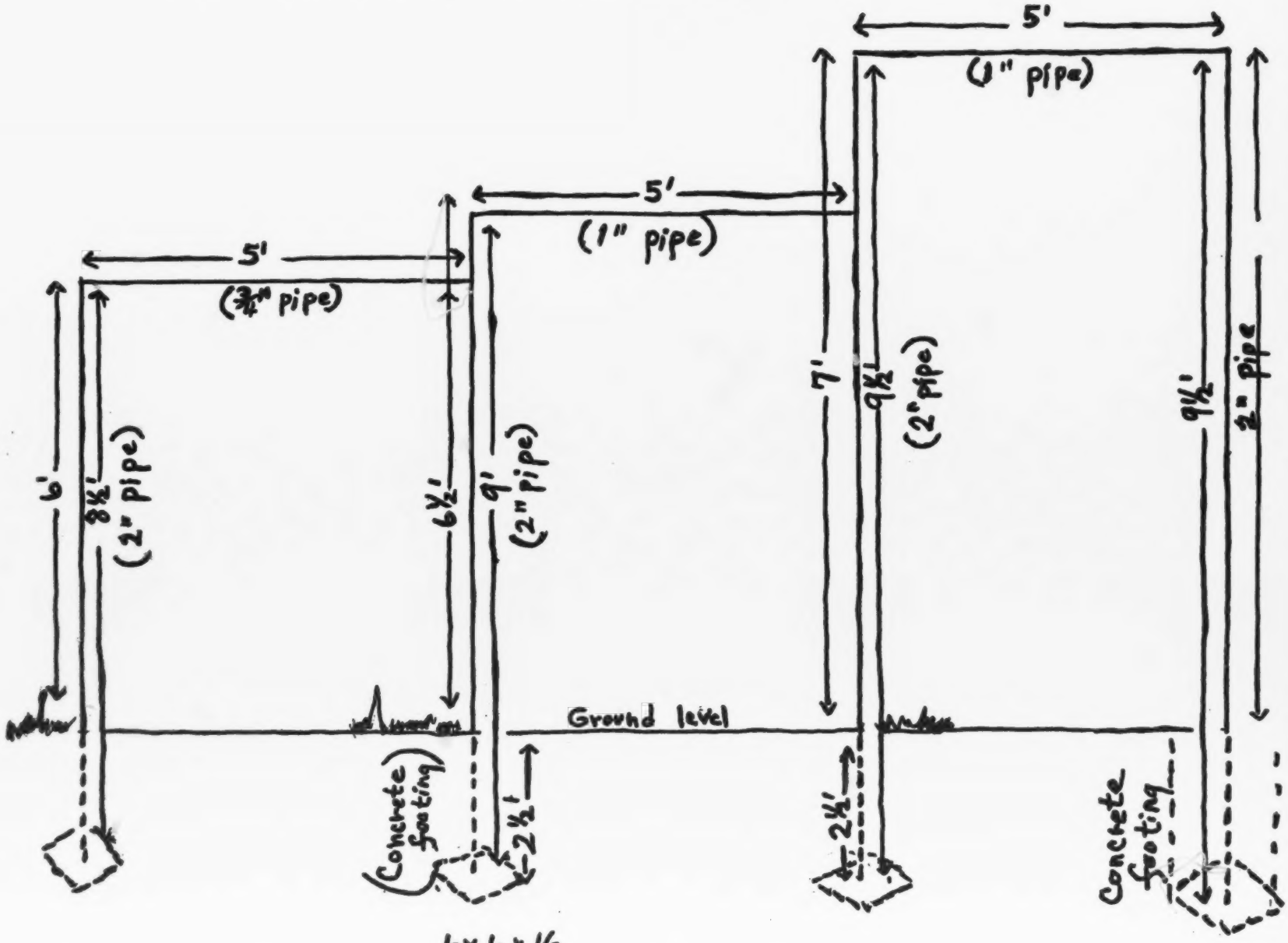
FOR GIRLS - Same design w/these changes

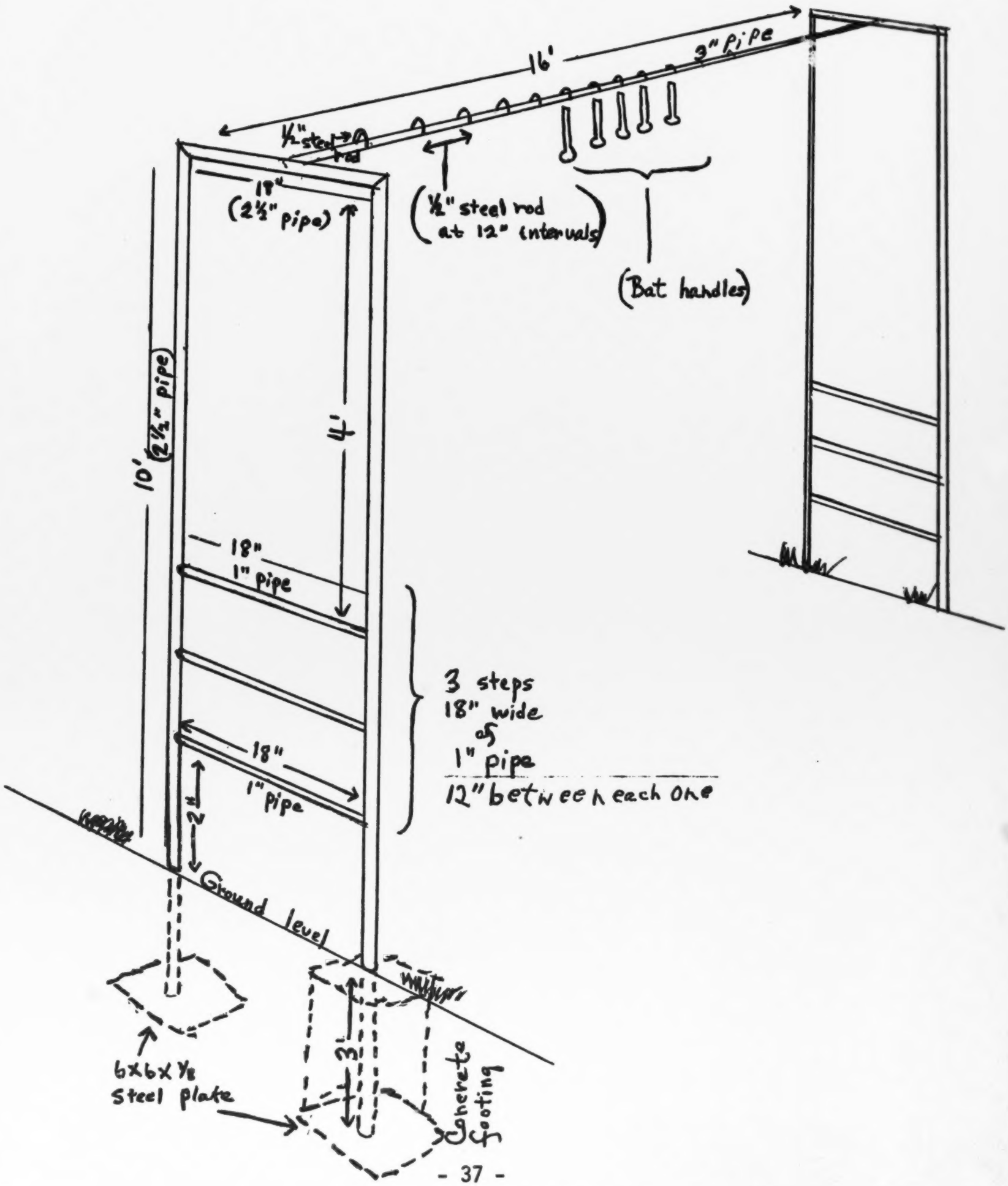
1st Bar - 4' 8" above ground level

2nd Bar - 5' 0" " " "

3rd Bar - 5' 4" " " "

All cross pieces for the girls should be 3/4" pipe which enables them to get a good grip for the flexed arm hang.




16'
3" pipe
½" steel rod
18"
(2½" pipe)
(½" steel rod at 12" intervals)
(Bat handles)
10' (2½" pipe)
4'
18"
1" pipe
3 steps
18" wide
of
1" pipe
12" between each one
18"
1" pipe
2'
Ground level
6x6x¼ Steel plate
3'
Concrete footing

top view

40' (overall length)

2" pipe

4'

1" pipe

12" width between each (1" pipe)

Side view

10' 2" pipe

10' 2" pipe

10' 2" pipe

10' 2" pipe

9' 2" pipe

9' 2" pipe

11' 2" pipe

9' 2" pipe

Ground level

3' Concrete footing

3'

3'

3'

6x6x⅛ Steel plate welded to 2" pipe

end view

4' wide

1" pipe

4'

9'

1" pipe

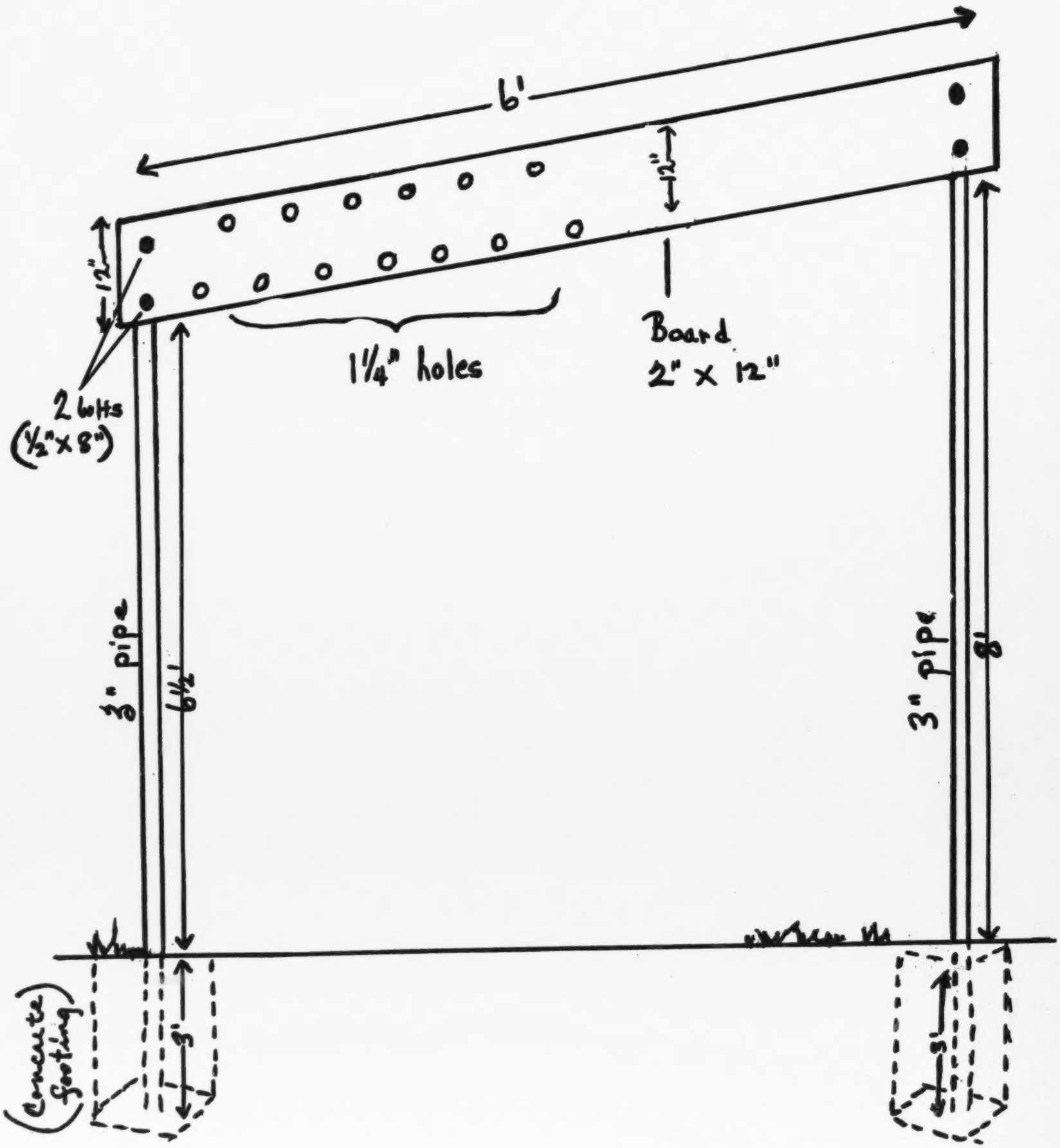
12" between each step (5 steps)

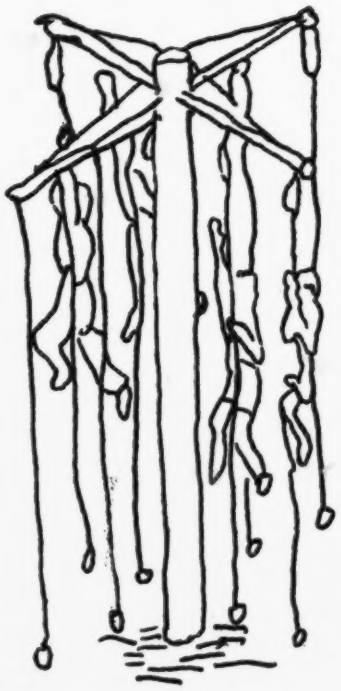
Ground level

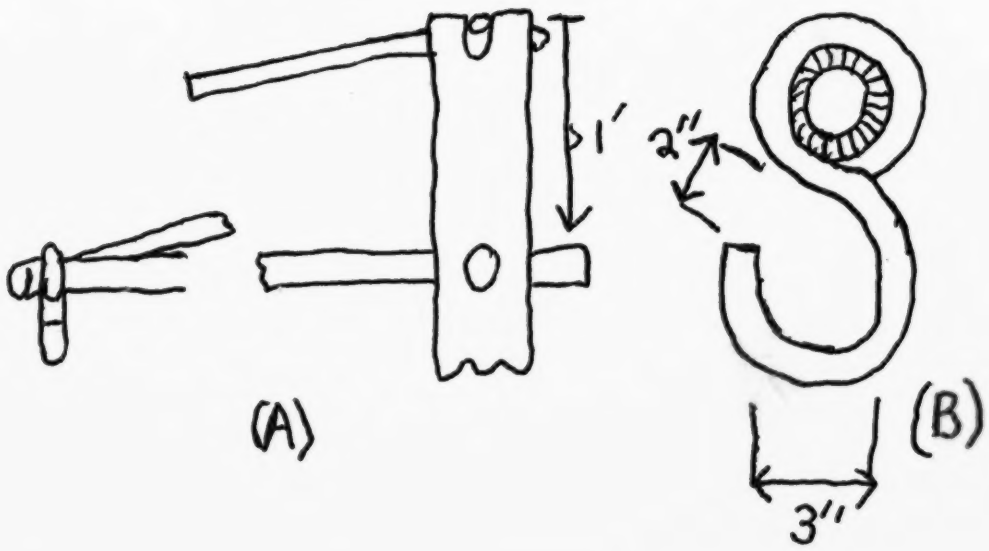
3' Concrete footing

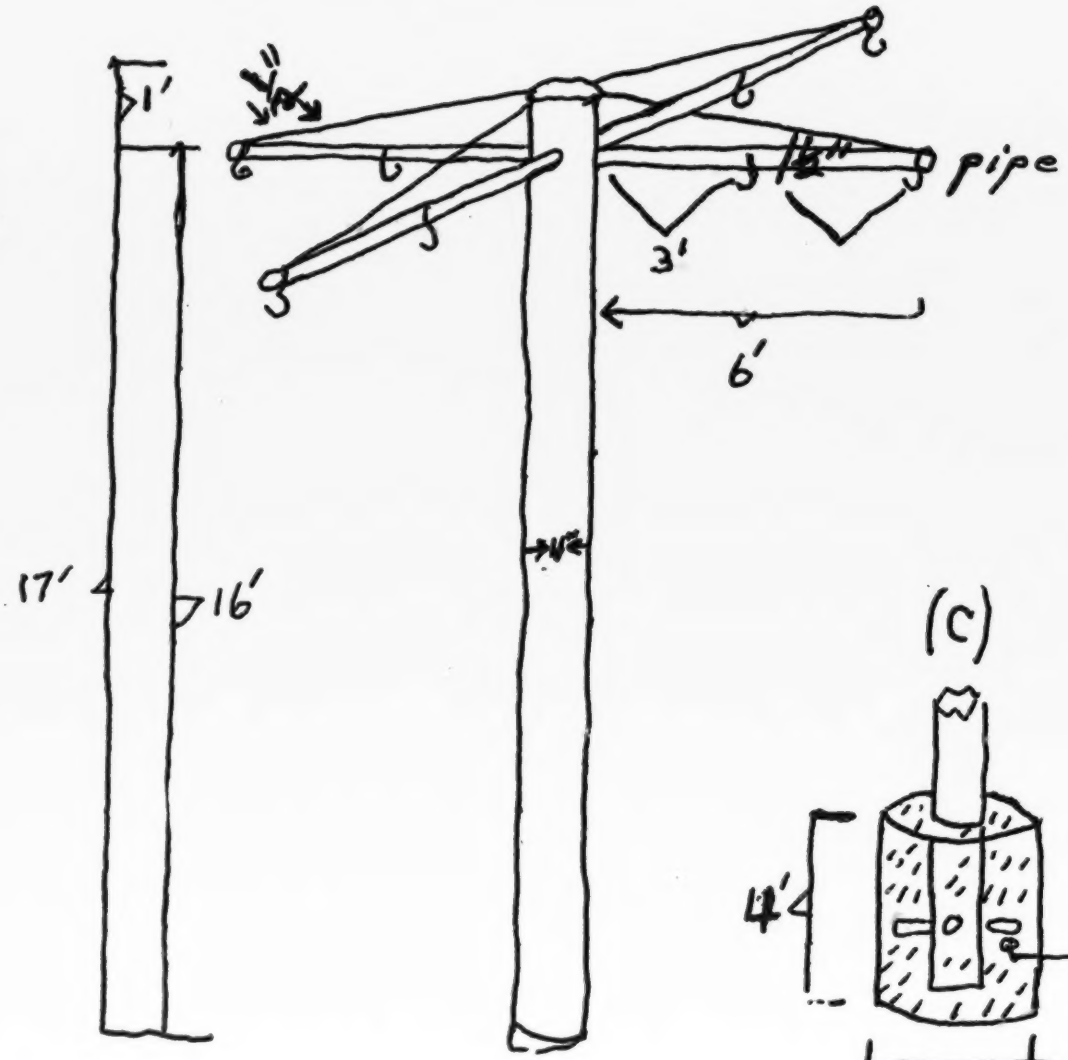
3'

6x6x⅛ steel plate


6'
12"
12"
1¼" holes
Board
2" x 12"
2 bolts
(½" x 8")
3" pipe
6½'
3" pipe
8'
3'
3'
(concrete footing)

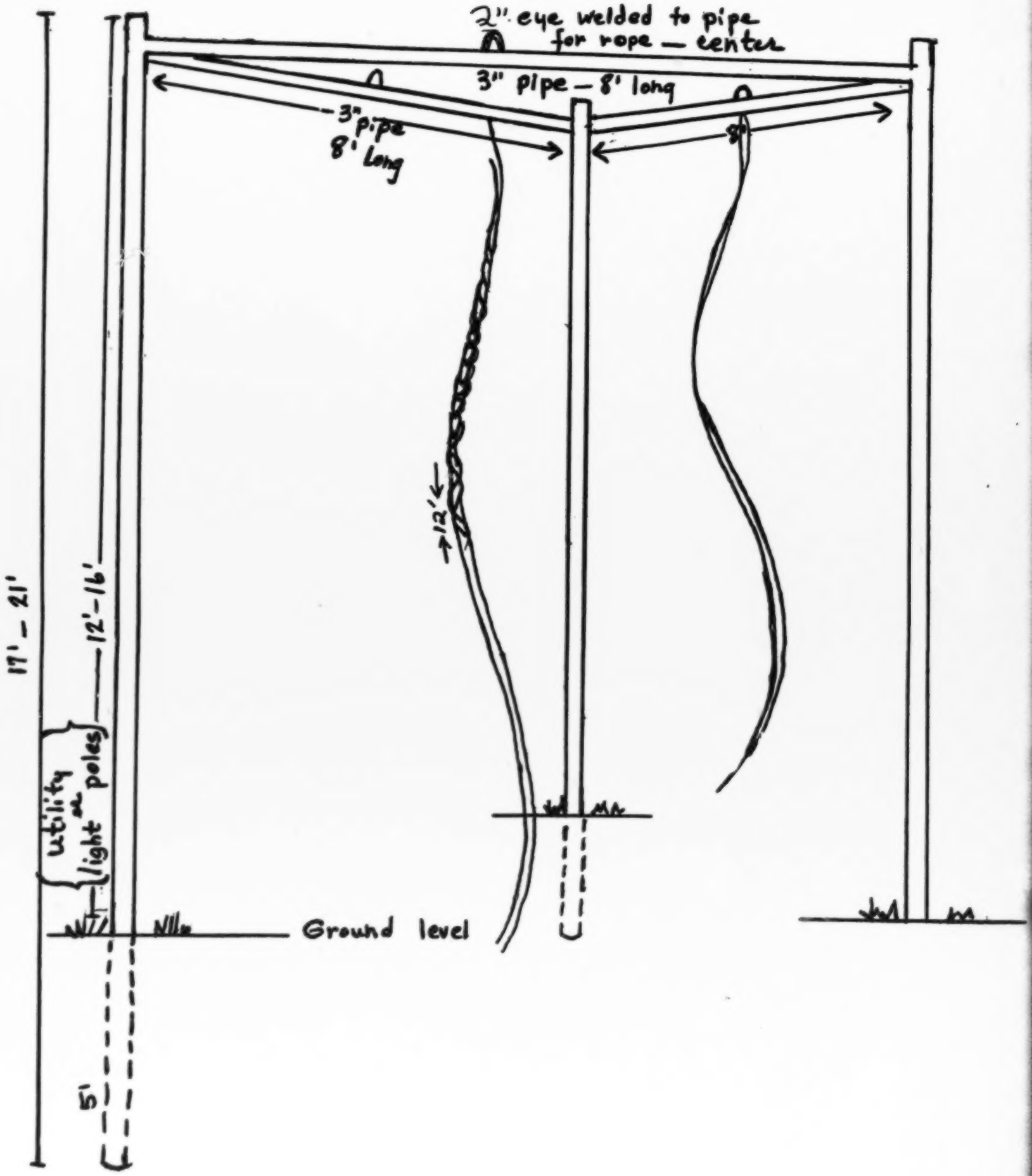




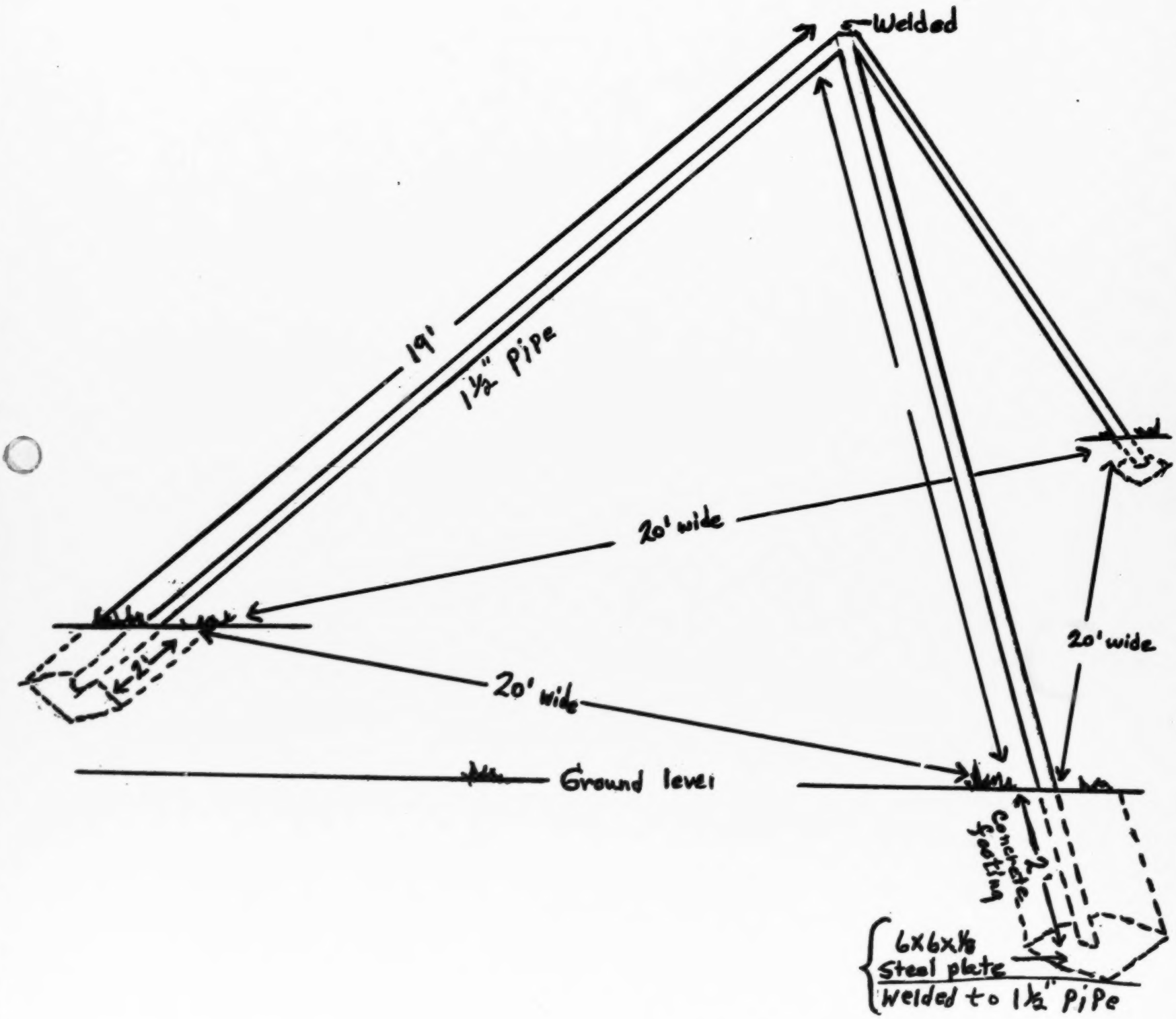


NOTE

Hook Attachment for Hanging Rope


2" eye welded to pipe for rope – center
3" pipe – 8' long
3" pipe 8' long
8'
12'
17' – 21'
12'-16'
utility light poles
Ground level
5'

TRIPOD - 8


Welded
19'
1½" Pipe
20' wide
20' wide
20' wide
Ground level
2'
Concrete footing
6x6x⅛ Steel plate welded to 1½" Pipe

ACKNOWLEDGMENT

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Orientation and Planning Conference, for this Title III Project held at Lake City, Florida, August, 1967.

T-III
EF

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